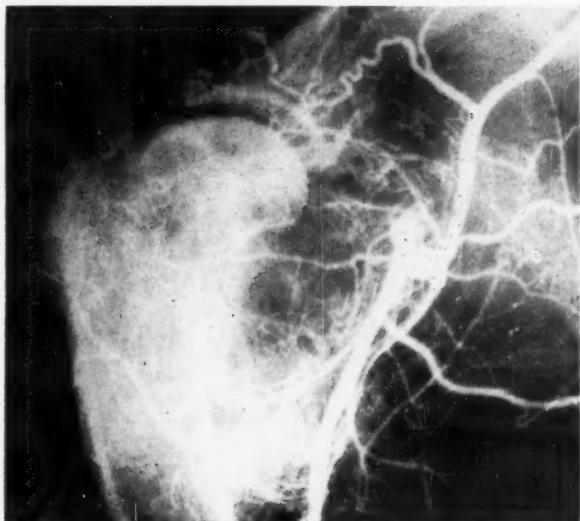


Annual AVMA Meeting
Miami Beach, Florida
August 12-16, 1962

Journal

OF THE
AMERICAN VETERINARY
MEDICAL ASSOCIATION



Arteriography permits differentiation of benign and malignant bone changes.
Page 1293



Vol. 139 December 15, 1961 No. 12



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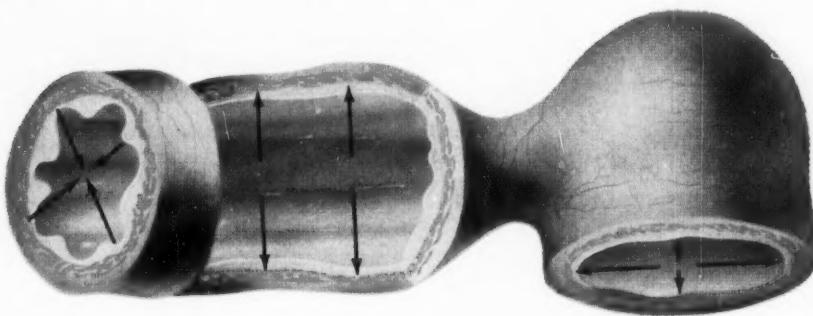
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Vol. 139 No. 12 December 15, 1961

OF THE
**AMERICAN VETERINARY
MEDICAL ASSOCIATION**

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Correspondence

Spontaneous Atherosclerosis of Swine

October 5, 1961

Dear Sirs:

We noted with interest the article by Drs. Skold and Getty entitled "Spontaneous Atherosclerosis of Swine" which appeared in the September 15 issue of your JOURNAL.

It is gratifying to know that other workers are observing lesions of spontaneous atherosclerosis in swine, thus supporting the work of Gottlieb and Lalich (*Am. J. Path.*, 30, (1954): 851); Jennings, Florey, Stehbens, and French (*J. Path. & Bact.*, 81, (1961): 49); and our work (Rowell, Downie, and Mustard, *Canad. M. A. J.*, 79, (1958): 647, and *Canad. M. A. J.*, 83, (1960): 1175). All of these articles have reported the spontaneous occurrences of atherosclerosis in swine, even though in some cases dietary manipulations were part of the experimental procedure.

We would like to remark on the statement made by these authors in their discussion, page 658, second paragraph, which states "Review of the literature revealed no reports of atherosclerosis occurring spontaneously in healthy, uncastrated swine of both sexes." We quote from our paper which appeared in the *Canadian Medical Association Journal*, 1960, 83, 1175, third paragraph under the subheading Pathology, "Atherosclerosis in swine as in man and some other animals occurs to some extent whatever the fat content of the diet. This suggests that in man and some animals there is a basic mechanism by which atherosclerosis develops. The addition of certain foods to the diet accelerates this mechanism, giving rise to increased atherosclerosis." In our papers we have reported the development of atherosclerosis in control animals which were on normal swine rations.

We commend the authors for their report and their statement that the pig should serve as an excellent laboratory animal for future investigations of atherosclerosis.

It is gratifying to see articles on comparative pathology published in the JOURNAL of the AVMA, for this field has been overlooked, and it is one in which veterinary science and medical science working in collaboration mutually assist one another in the study of the pathogenesis of disease.

s/H. C. ROWSELL, D.V.M., PH.D.
Ontario Veterinary College

* * *

October 9, 1961

Dear Sirs:

Dr. H. C. Rowsell has furnished us with a copy of a letter which he mailed to you concerning the article by Drs. Skold and Getty published Sept. 15, 1961, in the *J.A.V.M.A.* 139, (1961): 655-660, entitled "Spontaneous Atherosclerosis in Swine."

In our article we made the statement "Review of
(Continued on page 1256)

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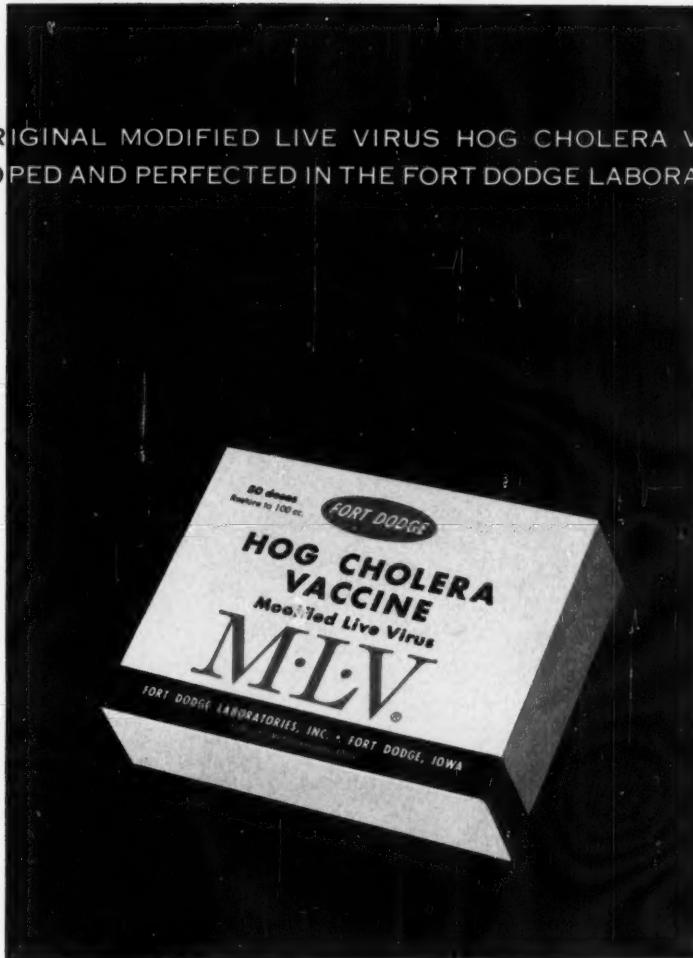
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CORRESPONDENCE—continued

the literature revealed no report of atherosclerosis occurring spontaneously in healthy, uncastrated swine of both sexes." We think that perhaps Dr. Rowsell feels we have implied that spontaneous atherosclerosis in swine has not been reported and we regret indeed, if this is the case. We wished to document the lesion in uncastrated swine of both sexes. We could find no references to uncastrated swine of both sexes in the three articles: Gottliebs and Lalich, *Am. J. Path.*, 30, (1954): 851; Jennings, Florey, Stehbens, and French, *J. Path. & Bact.*, 81, (1961): 49; and Rowsell, Downie and Mustard, *Canad. M. A. J.*, 83, (1960): 1175.

We were cognizant of the articles cited by Dr. Rowsell as evidenced by the fact that we too cited the same in our own published article. Perhaps it should be mentioned that in article one, arteriosclerosis rather than atherosclerosis was discussed. Article two cites one hog. In Dr. Rowsell's article, as indicated by the title "Comparison of the Effect of Egg Yolk or Butter on the Development of Atherosclerosis in Swine," it was emphasized that atherosclerosis could be produced by dietary means. Since the specific sex conditions of both control as well as experimental animals were not mentioned, we thought it appropriate to place in the literature a documented report of a large number of uncastrated animals revealing spontaneous atherosclerosis which were free from an experimental environment.

We trust and hope this will clarify our statement made in your recent JOURNAL. We are pleased for

the interest shown and appreciate the constructive comments which Dr. Rowsell has offered.

S/BERNARD H. SKOLD, D.V.M., M.S.,
AND R. GETTY, D.V.M., PH.D.
Iowa State University

AVMA Style Guide

July 27, 1961

Sir:

The 1955 edition of the *AVMA Style Guide* has been in almost constant use here because the faculty members have requested students to follow it in the preparation of term papers and in the organization of manuscripts required for other purposes, such as seminars. Please send at least one copy of the 1961 Guide for our Library Reading Room Reference Shelf.

s/MRS. DON J. (WINIFRED) WEDDELL
Veterinary Medicine Library
University of Georgia, Athens

• • •

August 9, 1961

Dear Sir:

With respect to uniformity, clarity, and various styles used by speakers, the 1961 *AVMA Style Guide* will be useful in preparing symposium papers for publication. If you will send additional copies, we will make certain that each of our speakers receives one.

s/HARRY MILLER, Director
Gaines Dog Research Center, New York, N.Y.

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news from Washington . . .



FROM THE AVMA WASHINGTON OFFICE
J. A. McCallum, VMD
Brig. Gen. USA (Ret.)

Military Liability of Veterinarians

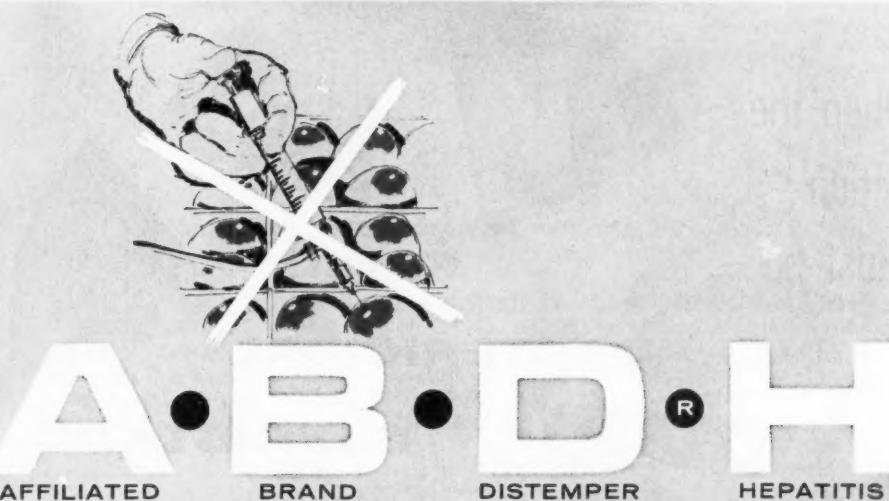
Local draft boards expedite preinduction physical examination and processing of veterinarians for military service under Special Call No. 31, National Headquarters Selective Service System (see JOURNALS, Nov. 15, 1961, p. 1054; Dec. 1, 1961, p. 1166). All persons subject to the Universal Military Training and Service Act who were deferred to complete their education have a military liability to age 35. However, according to par. 1, Special Call No. 31, the provisions of Section 1631.7(a) (1), (2), (3), and (4) of Selective Service Regulations will govern the selection by local boards of veterinarians during the induction period specified in this Call: Regarding age—Not attained 26 years. The Section cited pertains to registrants in class IA, and Classes I-A-O found acceptable for service in the Armed Forces. Information relative to certain Subsections of Section cited above, briefly: (2) pertains to volunteers; (3) nonvolunteers not attained age 26 years and who do not have a child or children, oldest being selected first; (4) nonvolunteers not attained age 26 years and who have a child or children, oldest being selected first.

Examinations for USPHS

Department of HEW has announced competitive examinations for appointment of veterinary officers to Regular Corps of U.S. Public Health Service. That for senior assistant applicants will be held Feb. 13-15, 1962; for assistant applicants, February 13-16. The examinations will be given at various places throughout the United States; however, each candidate will be tested at examining center nearest his home. Application forms may be obtained from: Chief, Division of Personnel (p), Department of Health, Education, and Welfare, Washington 25, D.C., or the nearest field station of the Public Health Service. Completed application forms must be received in the Division of Personnel no later than Jan. 5, 1962.

Major Cooney, President Military Surgeons

Major General James P. Cooney, USA (ret.), was elected president, Association of Military Surgeons, at the 68th annual meeting on Nov. 7, 1961. Dr. Cooney, a former Army deputy surgeon general, is vice-president for medical affairs of the American Cancer Society.



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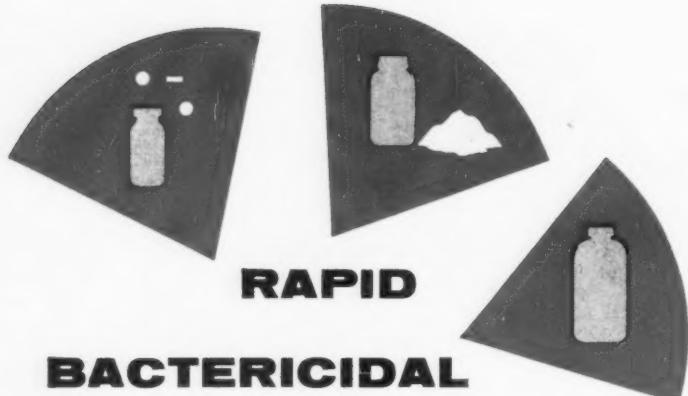


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VETERINARY DIVISION

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Secretaries Conference Meets

The Third Annual Conference of Constituent Association Secretaries, sponsored by the AVMA, met in Chicago, Ill., Nov. 4-5, 1961. At the meeting, secretaries from state V.M.A.s were provided with up-to-date information on the plans of AVMA and what they can do at the state level to help make national programs successful. They exchanged ideas on state level programs and problems, and they heard presentations by experts on communications, practical politics, and association tax problems.

Total registration at the meeting was 55. This included 40 constituent association secretaries, a representative of the Illinois women's auxiliary, ten members of the AVMA staff, and four AVMA officers.

A.V.M.A. officers who attended the meeting are Dr. Mark L. Morris, president; Dr. Andy Crawford, vice-president; Dr. Dan J. Anderson, president-elect; and Dr. Jack O. Knowles, chairman of the Executive Board.

The group heard two panel discussions, one on interprofessional relations, the other on membership promotion. Guest speakers discussed "Communications as a Means of Group Motivation," "Practical Politics," and "Incorporation of Associations and Exempt Tax Status." Information presentations were given by AVMA staff personnel on career recruitment, the Association newsletter, legislative contacts, and centennial planning.

Here are some of the ideas exchanged at the meeting:

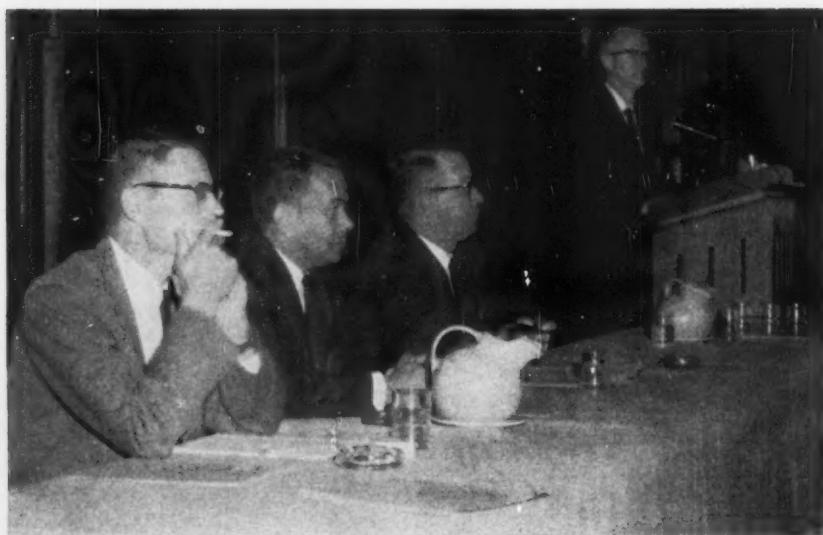
First on the program, Dr. James R. Hay, AVMA director of professional relations, described the Association's nine-point career recruitment program. The program calls for state level career recruitment committees to cover the state in contacting guidance counselors and parent-teacher organizations; similar auxiliary committees; contacts with colleges of veterinary medicine to verify the current needs for recruitment of students; career and vocational guidance literature distribution to students, counselors, parents; speeches on veterinary medicine by practitioners; science fair participation; promotion of activities and programs of veterinary colleges; showing of films and exhibits on veterinary medicine to local civic groups; and local V.M.A. participation in youth activities. "Career recruitment for veterinary medicine is every veterinarian's responsibility," Dr. Hay said.





As the secretaries settled down for two days of idea exchanging, Dr. Fred Hall, Indiana, rose to tell how the Indiana V.M.A. had solved a membership problem.

Interprofessional Relations



Panel on Interprofessional Relations is shown here. Panel members are (left to right): Dr. C. B. Hostetler, executive secretary of the Illinois V.M.A.; Dr. G. B. Estes, secretary of the Virginia V.M.A.; Dr. F. D. Wertman, executive secretary of the Iowa V.M.A.; and Dr. D. A. Price, editor-in-chief of AVMA publications and moderator of the panel discussion.

Dr. F. D. Wertman: "The Iowa Interprofessional Association had its first meeting in 1934. Medicine, pharmacy, dentistry, nursing, hospital administration, and veterinary medicine are the professions represented. . . . Work with the other members of the health team is a challenge. Through such relations we make other professions more aware of our profession, and we better fill our role on the health team," Dr. Wertman said. Some special features of the Iowa Interprofessional Association are a joint career recruitment program, a civil defense program, a legislative program, county level groups, and a speakers bureau.

Dr. G. B. Estes: Dr. Estes discussed the Virginia Council on Health and Medical Care. He said the purpose of the organization is "to assist young people in selecting

a career and point out to them the opportunities open in the health fields." Veterinary medicine is one of 20 medical and health professions represented on the Council.

Dr. C. B. Hostetler: "To get an idea of the problems faced by an interprofessional organization, just multiply the problems of your own organizations by five," said Dr. C. B. Hostetler when he discussed the Illinois Interprofessional Council with the secretaries. He said there are five member-organizations in the Illinois Interprofessional Council, which he referred to as the "healing arts United Nations." Some of the objectives of the Illinois Interprofessional Council are to promote better relations between the health and medical professions, and to aid in the integration of the activities of member-organizations interested in the advancement of health and medicine in the state of Illinois.

Membership Promotion



Dr. Fred Hall, secretary of the Indiana V.M.A. discusses membership promotion as other panel members listen. They are (left to right): Mr. Paul Cain, executive secretary of the Texas V.M.A.; Dr. F. D. Wertman; and Mr. Richard Morrison, AVMA director of membership services and panel moderator.

Dr. Fred Hall: "We have to show members and potential members that the state association is a live organization. To do this in Indiana we have appointed district directors to make personal contacts with veterinarians. We, in turn, have to keep in touch with the district directors and also have to do as much personal contact work as we can. Membership promotion is most effective when it is done on a local level. In Indiana, when a man joins his local group and is recommended to the state

society, he is accepted on that basis alone. It is important to have material to use in presenting the story of an association to the people you contact."

Mr. Paul Cain: "Any dues paying member has a right to ask, 'What am I getting for my dues?' And so, a program of visible public relations that can be seen and felt and heard is the heart of membership promotion. Just as members and potential members must know what services we provide, we must know what services the members need. Printed communications, field work, and personal contact with the member and potential member are most important."

Dr. F. D. Wertman: "A strong association is an informed association. In Iowa there are 1,000 veterinarians and 850 of them are members of the Iowa V.M.A. This is 77%. Most important is keeping your members informed. Then provide strong leadership and you will have a strong association. Potential members, seeing this, will want to become a part of it."

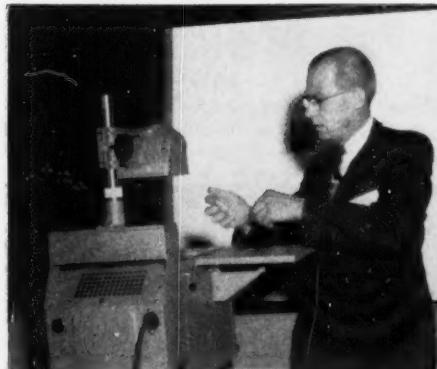


Opportunities for discussing ideas informally were provided at breaks in the sessions. The AVMA exhibit, "AVMA in Action," in the background of this picture, was shown at the meeting. Secretaries were given an opportunity to schedule the exhibit for showing at state meetings.

Mr. Heinz Kuehn, AVMA director of public information, reported that the new AVMA Newsletter was conceived and executed to improve communications with state secretaries and, through them, with the membership. "The newsletter is being put out by the public information department to promote and arouse interest in the AVMA and to solicit participation in the activities of the AVMA," he said. In a presentation on centennial planning, Mr. Kuehn told the secretaries, "Centennials are in essence public relations programs. The Centennial of the profession will take place throughout the United States and Canada in 1963. Here is your chance to tell people in your state about veterinary medicine and ask them to celebrate the Centennial with you," he said.



"Communications as a Means of Group Motivation" was the subject of a talk given by Dr. Hideya Kumata, professor of communications at Michigan State University. Dr. Kumata pointed out that Americans don't like to read. He said that a recent survey showed that 65% of American adults don't even read one book a year. "Most of the communications programs in the veterinary profession seem to be geared to printed material," he noted. "This is an impersonal means of communication, and the best you can hope for is to push existing attitudes in a favorable direction. If you use impersonal means of communications, it seems evident that people who are likely to read what you have to say are those who are already for you." Dr. Kumata pointed out that face to face contact is the most effective communication method.



Dr. H. E. Kingman, Jr., AVMA executive secretary, discussed the need for legislative contact between Washington congressmen and secretaries in each state. He showed them which recent legislative efforts of the Association have been successful and how this correlated with active legislative contact programs. When bills were successful, there was, in most cases, a veterinarian urging his congressman to approve the bill. The same correlation applied when Dr. Kingman pointed out unsuccessful legislative efforts. In these cases veterinarians had not contacted congressmen on hearing committees. Dr. Kingman urged that states get active people to serve as legislative contacts so that the Association could be more successful in its Washington program.



Mr. Richard Anderson, division manager of the Chamber of Commerce of the United States discussed "Practical Politics" with the secretaries. He described the nationwide political action program of the Chamber of Commerce and told of the success of the program in developing political leaders.

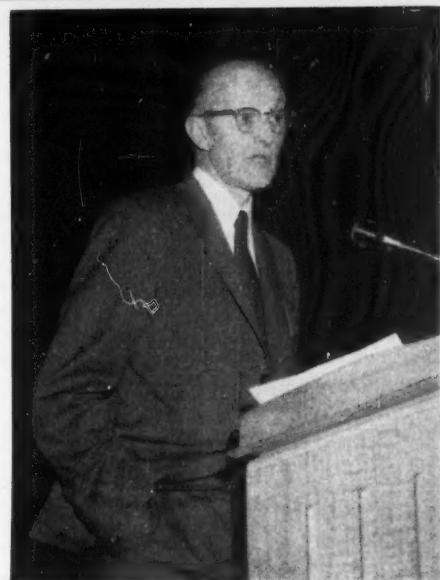


Mr. Allan Brodie, of Bell, Boyd, Marshall & Lloyd, a Chicago law firm, said that there are two forms veterinary associations must be concerned about in claiming tax exempt status. Form 1024 asks for ordinary information, financial statements, descriptions of the organization, and Form 990, the annual return, asks for information on the activities of the association each year to make sure it continues to be entitled to tax exemption. "Usually, before this form is accepted, tax exemption will have been granted," he said. Mr. Brodie also briefly discussed the professional association incorporation laws which have been passed in several states. He said that these laws permit groups of physicians (and veterinarians) to join together as a corporation and get tax advantages for setting aside money for retirement. The major stipulation of the law is only that the retirement plan must not favor any group of employees in the corporation.

During another break in sessions, some secretaries discussed their own special problems on tax exemption with Mr. Brodie.



AVMA president, Dr. Mark L. Morris, reviewed his presidential address, "The Blueprint for Action," with the secretaries, and discussed in detail some of his statements in the address.



Board of Governors Meets in Chicago

Selective Service, refugee Cuban veterinarians, liability insurance, and district meetings were on the agenda when the AVMA Board of Governors met in Chicago November 3.

The Board discussed the recent call to local draft boards by Selective Service for 67 veterinarians to report in November. The call is in addition to the regular call for approximately 100 veterinarians to be taken in June to replace those who have completed their service. The following day, at the annual meeting of constituent association secretaries, the Board told the secretaries that the best way to avoid disruption of veterinary service in a community is to work closely with the veterinarian on the State Advisory Committee to Selective Service. A current list of these veterinarians is being sent to all constituent associations.

At their meeting, the Board of Governors also extended recognition to the Cuban Veterinary Medical Association in Exile, the newly formed association of refugee Cuban veterinarians, as officially representing that group.

The Board requested that the AVMA staff, in cooperation with the Association's insur-

ance consultants, conduct a study to evaluate the AVMA professional liability insurance, and to recommend ways in which it could be expanded and strengthened.

To establish a closer liaison between AVMA Executive Board members and constituent associations, the Board of Governors set dates and selected meeting sites for four Executive Board districts. At these district meetings, state secretaries, delegates, alternate delegates, and other members of constituent association executive committees will appraise the status of organized veterinary medicine in 18 of the 50 states. Here's where the meetings will be held:

District X, Los Angeles, Nov. 11, 1961. District X represents Arizona, California, Hawaii, and Nevada.

District V, Milwaukee, Jan. 14, 1962. District V represents Illinois, Indiana, and Wisconsin.

District IX, Salt Lake City, Jan. 26, 1962. District IX represents Colorado, Nebraska, New Mexico, North Dakota, South Dakota, Utah, and Wyoming.

District IV, Columbus, Ohio, Feb. 4, 1962. District IV represents Kentucky, Michigan, Ohio, and West Virginia.

Cuban Veterinarians Seek Lay Employment

About 40 Cuban veterinarians, who fled to the United States from Cuba, are now faced with problems of supporting themselves and their families. These veterinarians cannot become licensed veterinarians in the United States because they did not graduate from veterinary schools recognized by state examining boards.



Dr. Gonzales Mayo



Dr. Fico Sanchez-Escoto

Under the direction of Dr. Fico Sanchez-Escoto and Dr. Gonzales Mayo, they have formed their own association called "The Cuban Veterinary Medical Association in Exile." It is located at 10971 S.W. 58th Terrace, Miami 43, Fla. At a recent AVMA Board of Governors meeting, this organization was recognized by AVMA as officially representing the refugee veterinarians.

Working with the Cuban organization, the South Florida V.M.A. has been trying to place Cuban veterinarians in positions as technicians, nurses, interns, assistants, and kennelmen in veterinary hospitals. Because they want to remain a part of the veterinary profession, these veterinarians are accepting lay jobs in the veterinary field at lay salaries. Dr. Jack O. Knowles, AVMA Executive Board chairman, pointed out to the Board of Governors, in discussing the problem, that Cuban veterinarians employed by Florida practitioners have worked out "extremely well."

Efforts are now being made to relocate the veterinarians that cannot be absorbed in the Miami area. Through the impetus of the South Florida association working with AVMA Washington representative, Gen. J. A. McCallam, the federal government has said it would pay part of the relocation costs for these people. Veterinarians interested in employing them can secure information sheets on their education, special qualifications, and ability to speak foreign languages by writing to Dr. Harry V. Bice, Jr., Turnpike

Animal Clinic, 2460 State Service Rd., Opa Locka, Fla.

The South Florida association, again working with Gen. McCallam, has also secured the assistance of the federal government in teaching the English language to these Cubans so that they can more quickly become a functioning part of society in the United States. An accelerated language course was begun on November 14 in Miami. The Cubans are studying English five hours a day, five days a week. As part of this program, the government has also promised to contribute to the support of the Cubans until employment can be found for them.

Veterinary Classification and Salary Changes Reported by USDA

Recent changes in the civil service classification standards for veterinarian positions in the federal service now permit the Agricultural Research Service of USDA to employ regulatory veterinarians with one year or more experience at a salary rate of \$7,560 per annum (grade GS-11). Previously the hiring rate for veterinarians, experienced or not, was \$6,435 per annum (grade GS-9).

Graduate veterinarians of approved veterinary colleges who do not have a year's experience are appointed at the GS-9 grade salary of \$6,435 per annum, but may be promoted to the higher rate as soon as they have obtained the necessary experience.

This change in classification and salary levels was given impetus by the AVMA. At the 1960 AVMA convention in Denver, a resolution adopted by the House of Delegates directed the Association to request the U. S. Civil Service Commission to conduct a complete occupational study and survey of veterinary positions in the USDA and other governmental agencies. The new plan, somewhat a compromise of the original AVMA request for a higher classification and pay scale for veterinarians, stems from that resolution.

Under the new scale, in addition to the base salary of \$630 per month being offered experienced veterinarians, the federal veterinarian gets vacation leave with pay, sick leave if he needs it, and many other fringe benefits such as health insurance, life insurance, and retirement plans. According to figures recently issued by the U. S. Civil

Service Commission, these fringe benefits amount to approximately 20% additional salary.

It is essential that veterinarians be continually added to the present force of 1,500 federal veterinarians to meet expanding program needs and to fill vacancies created through normal turnover. The need for additional veterinarians is particularly acute

in the federal meat inspection program at this time.

Qualified veterinarians interested in federal employment are urged to contact the Personnel Division, Agricultural Research Service, USDA, Washington 25, D.C., or they may contact the nearest federal veterinarian in charge of meat inspection or of livestock disease control and eradication activities in their vicinity.

Veterinary School Enrollment Exceeds 4,000

Student enrollment at the schools and colleges of veterinary medicine in the United States and Canada has reached an all-time high of 4,008.

Last year, the total enrollment at the 20 U.S. and Canadian veterinary schools was 3,832. Here are the enrollment figures for the past four years:

1958-1959	3,751
1959-1960	3,778
1960-1961	3,832
1961-1962	4,008

There are 1,104 freshmen veterinary students at the 20 schools. This is another high enrollment figure. It is nine students over last year's total of 1,095, and 48 students over the 1960 figure of 1,058. This year's 1,104 students were selected from 2,134 applicants.

Of the 1,104 freshmen veterinary students, 55 have had five years, 214 have had four,

and 301 have had three years of preprofessional work; 443 have had two years of preprofessional work except for a few applicants to Canadian schools who entered without two years of preprofessional work because they satisfied specific entrance requirements.

A total of 210 first-year students have advance degrees—197 have B.S. or B.A. degrees and 13 have M.S. or M.A. degrees. One first-year student holds a B.C.E. degree.

Veterinarians engaged in graduate studies at veterinary schools total 403. Last year, there were 354 veterinarians doing graduate work; the year before, there were 288; and 11 years ago there were only about 130.

There are 157 women enrolled in veterinary colleges—62 first-year students, 40 second-year students, 34 third-year students, and 21 fourth-year year students. Five women are performing graduate work.

Veterinary Student Enrollment for Academic Year 1961-1962

Schools	1st Year	2nd Year	3rd Year	4th Year	Total		Grad- uate
					1962	1961	
Auburn University	58	56	45	61	220	224	...
California, University of	52	49	46	50	197	195	3
Colorado State University	69	65	60	62	256	260	...
Cornell University	60	56	54	57	227	227	10
Georgia, University of	65	56	44	58	223	219	2
Illinois, University of	46	39	31	34	150	152	...
Iowa State University	63	62	57	62	244	255	3
Kansas State University	68	60	63	59	250	257	1
Michigan State University	64	58	46	56	224	236	...
Minnesota, University of	54	35	46	34	169	172	7
Missouri, University of	30	25	27	30	112	113	...
Ohio State University	73	67	69	67	276	279	1
Oklahoma State University	48	34	41	31	154	152	3
Ontario Veterinary College*	75	76	69	57	277	234	...
Pennsylvania, University of	61	50	46	44	201	196	1
Purdue University	49	48	45	...	142	95	2
Quebec School of Veterinary Medicine**	28	29	19	27	103	101	...
Texas, A. & M. College of	66	58	52	51	227	221	2
Tuskegee Institute	25	16	9	17	68	58	...
Washington State University	50	46	47	43	188	186	...
TOTAL	1,104	979	916	903	4,008	3,832	33
							403

*There are 44 fifth year students at Ontario.

**There are 30 students in pre-veterinary courses at Quebec.

State of Residence—First-Year Students
 (Number from Each State and Province)

	AUBURN	CALIFORNIA	COLORADO	CORNELL	GEORGIA	ILLINOIS	IOWA	KANSAS	MICHIGAN	MINNESOTA	MISSOURI	OHIO	OKLAHOMA	ONTARIO	PENNSYLVANIA	PURDUE	QUEBEC	TEXAS A. & M.	TUSKEGEE	WASHINGTON	TOTAL	
Alabama	18							1											2	...	20	
Alaska		4						1											1	...	1	
Arizona			4					1										1	...	7		
Arkansas				1				1												7		
California	46	4	1				1											1	...	53		
Colorado		36																		36		
Connecticut			2																	8		
Delaware																				2		
Dist. of Columbia								1												2		
Florida	10			1								1								12		
Georgia			23															1	...	24		
Hawaii																				0		
Idaho		3																3	...	6		
Illinois			43	7	3												1	...	55			
Indiana					1	1													46			
Iowa					41															41		
Kansas						47														47		
Kentucky	11						1					1		1				1	...	15		
Louisiana							1					1					10	1	...	12		
Maine			1																	1		
Maryland				7																11		
Massachusetts					1	1						2								4		
Michigan									46											46		
Minnesota									47											47		
Mississippi							9													11		
Missouri										1		30								31		
Montana						1												1	7	9		
Nebraska	1	6	1			6	5						2							21		
Nevada																				0		
New Hampshire						1	1													2		
New Jersey			7		1	1	4					1		5						19		
New Mexico	1	3																		6		
New York		2	41	1	1	1	2							8	1					57		
North Carolina				8								1	1					3	...	15		
North Dakota										1		62								64		
Ohio												32						1	...	33		
Oklahoma			2	1														7	...	10		
Oregon														37				1	...	41		
Pennsylvania			3																	1		
Rhode Island			1																	1		
South Carolina					8															9		
South Dakota																				4		
Tennessee	10							1	1	2								1	...	11		
Texas		1						1					2				56	...	60			
Utah			3					1											4			
Vermont																				1		
Virginia					16		1											3	...	20		
Washington																			26	26		
West Virginia														4	1					5		
Wisconsin								2	1	2	4						1			10		
Wyoming			6																3	9		
Province																						
Alberta															5					5		
British Columbia																				0		
Manitoba														8						8		
New Brunswick														1						1		
Newfoundland														1						1		
Nova Scotia														2						2		
Ontario														36						36		
Prince Edward Isle														1		24				1		
Quebec														14						25		
Saskatchewan																				14		
*Foreign		1	2		2		4		2		6		6		4		6			27		
TOTALS		58	52	69	60	65	46	63	68	64	54	30	73	48	75	61	49	28	66	25	50	1,104

*Foreign students at California—1 from Ethiopia; at Iowa—1 from Guatemala, 1 from Israel; at Michigan—2 from Nigeria, 2 from Puerto Rico; at Cornell—2 from Nigeria; at Ohio—1 from Saudi Arabia, 1 from Puerto Rico; at Ontario—1 from

Hong Kong, 1 from the United Kingdom, 2 from Ghana, 1 from British Guiana, 1 from the United States; at Quebec—4 from France; at Tuskegee—1 from Haiti, 3 from the West Indies, 1 from Africa, 1 from South America.

USDA Student Trainee Applications Accepted

An examination announcement has recently been issued by the U.S. Civil Service Commission for junior year veterinary students wishing to work next summer as a student trainee for USDA on a GS-7 level at \$5,355 per annum.

A major change has been made in the examining process this year. Previously a written test was required. The new examination announcement provides that applicants merely complete the "Application for Federal Employment" (SF-57) and a brief index card form (Form 5000-ABC) and mail these forms and a list of their college courses to the Board of Civil Service Examiners, USDA, Washington, D.C.

Arrangements have been made by USDA to have veterinary contact representatives distribute copies of this examination announcement and other pertinent material to junior students in all U.S. veterinary schools.

Last summer more than 125 veterinary trainees were employed by the USDA Agricultural Research Service in various activities throughout the country.



Shown with Kansas' Governor John Anderson, Jr., as he signs the veterinary medicine week proclamation are (left to right): Charles Lingle, senior at the veterinary school; Tom Knappenberger, chairman of the open house; Governor Anderson; and Dr. E. E. Leisure, dean of the school and immediate past-president of the AVMA.

the Veterinary Medicine Clinic showing the care a dog should receive from birth until it is 6 months old. The exhibit also showed the nourishment needed by a dog in all stages of life, and the many different types of cancer an older dog may acquire.

A radiograph of a living heart under normal and abnormal conditions was also shown. A radiopaque substance was injected into the heart so that spectators could see on the radiograph the movement of blood through the heart.

Veterinary Medicine Week Observed in Kansas

The week of October 22 to 28 was proclaimed "Veterinary Medicine Week" in Kansas by Gov. John Anderson, Jr.

In the proclamation, Governor Anderson called it "reassuring and gratifying" that the veterinary profession is "exceptionally trained and prepared to alleviate the pain of animals, guard the health of livestock against epizootics, prevent the spread of animal diseases to man, and ensure supplies of edible animal food and food products for the health and well being of man."

He noted that these activities are important to the peacetime needs of the population and, especially, to the armed forces.

One of the highlights of the veterinary week observance in Kansas was the annual open house of the School of Veterinary Medicine at Kansas State University on October 28.

Among exhibits shown at the open house was a display in the small animal section of

California Veterinarians To Perform Cancer Research

California veterinarians will join state Department of Public Health officials in a \$3.5 million cancer field research program this fall.

The five-year project, financed by the National Cancer Institute, will be the most comprehensive field investigation of cancer ever undertaken by a state agency. Its purpose will be to discover the nature of cancer in animals and man.

Veterinarians will work closely with state public health field technicians investigating cancerous tissue found in dogs, cats, and some species of birds. Particular emphasis on field research will take place in Alameda and Contra Costa counties. All field speci-

mens will be sent to the Cancer Field Research Center at Berkeley for analysis.

Cancer investigations during the five-year project will center around four primary areas: human cancer epidemiology to determine personal characteristics and environmental conditions which may distinguish cancer patients from healthy individuals; viral studies, a continuation of attempts to isolate cancer agents in animal and human tissues; epizootiologic approach—a study of cancer in dogs, cats, parakeets, and of leukemia in dairy cattle and wild animals; and physical-chemical environmental studies.

The new cancer field research program will supplement work now being conducted in several research centers throughout the nation.

and their subjects were: Dr. Lester Barto (UP '30), president of the American Animal Hospital Association, who discussed "Modernizing the Surgery Department;" Dr. William I. Gay (COR '50), Bethesda, Md., "The Evaluation of Canine Hip Prostheses;" Dr. Jean Holzworth (COR '50), Angel Memorial Animal Hospital, "Respiratory Diseases of the Young Cat;" Dr. D. C. Blood, B.V.Sc., "The Diseases of the Respiratory Tract of Cattle;" Dr. Edwin Churchill (UP '41), "New Developments in Equine Practice;" and Dr. A. F. Ranney (COR '32), chief staff officer, Tuberculosis Eradication, Animal Disease Eradication Division, USDA. Dr. Dan Anderson (TEX '38), president-elect of AVMA, spoke at a banquet session of the meeting.

Officers installed at the meeting are: Drs. John MacIntosh (COR '28), Kensington, Conn., president; Edward Treat (OSU '33), Manchester, Vt., president-elect; Lewis B. Denton (COR '32), Houlton, Maine, vice-president; Warren Comstock (USC '26), Clayton, R.I., vice-president; George C. Cilley, Jr. (ONT '26), Concord, N.H., vice-president; Fred G. Ruder, Jr. (UP '48), Amherst, Mass., vice-president; David Hopkins (COR '30), Brattleboro, Vt., vice-president; Ernest H. Patchen (OSU '23), Milford, Conn., vice-president; and C. Lawrence Blakely (UP '33), Boston, Mass., secretary-treasurer.

Record-Breaking Attendance at New England Meeting

A record-breaking attendance of nearly 450 members and guests was drawn to the meeting of the New England V.M.A. October 1-4 at Poland Spring, Maine.

There were 21 speakers on the four-day program which was rounded out to give equal attention to large and small animal veterinary medical subjects and regulatory veterinary medicine. Some of the speakers



Showed before the AVMA exhibit which was displayed at the meeting of the New England V.M.A. are (left to right): Drs. Lewis B. Denton, past-president of the New England V.M.A.; Lester Barto, president of the American Animal Hospital Association; and Dan Anderson, president-elect of the AVMA.

Kansas V.M.A. Sponsors Scholarship

The Kansas V.M.A. has announced that it will again award a scholarship in veterinary medicine to a young person interested in a veterinary career. The association has been awarding such scholarships for the past few years.

The association also announced the appointment of John D. Kirkland, Herington, as assistant to the executive secretary. Mr. Kirkland will handle information and education programs for the association. The executive secretary of the Kansas V.M.A. is Dr. M. W. Osburn (ISU '34), Manhattan.



Highlights of the annual fall convention of the Oregon V.M.A. included an address by Dr. Blair Henningsgaard (standing left), president of the Oregon State Medical Society, and the presentation of the first Oregon V.M.A. Award of Merit to Dr. O. H. Muth (standing right). Others shown are Dr. J. C. Miller (seated) and Dr. Ray Storey, Oregon V.M.A. president.

New Zealand To Open Veterinary School

The Prime Minister of New Zealand has announced that a veterinary school will be established at Massey College, Palmerston North. New Zealand veterinary students have previously been trained in Australia. It is hoped that the opening of the veterinary school there will help overcome the country's shortage of veterinarians.

Physician Addresses Oregon V.M.A. Meeting

To emphasize the era of increased cooperation between physicians and veterinarians, the Oregon V.M.A. invited the president of the Oregon State Medical Society to be the major speaker at its September fall clinic in Corvallis, Ore.

Dr. Blair Henningsgaard told veterinarians at the clinic that the new liaison between the Oregon V.M.A. and the Oregon State Medical Society opened up many opportunities for greater service in protecting the public health. He also spoke of the medical profession's concern about the threat of socialized medicine as represented by the King-Anderson Bill in Congress.

Another highlight of the meeting was the presentation of the association's first Award of Merit for Distinguished Research to Dr. O. H. Muth (MSU '29), Corvallis, Ore., for

his efforts as senior member of a research team which discovered the use of selenium in treatment of white muscle disease.

A program of stepped-up career recruitment activity and a program of the association's auxiliary for a continuing fund-raising campaign for postgraduate research in veterinary medicine were approved at the clinic.

Dr. A. P. Schneider (WSU '38), Boise, Idaho, president of the U.S. Livestock Sanitary Association, who spoke at the meeting, alerted veterinarians to the increasing danger of exotic diseases affecting horses, cattle, and swine.

New Appointments at Quebec Veterinary School Announced

Two new appointments have recently been announced by the School of Veterinary Medicine of the Province of Quebec, Saint Hyacinthe.

Dr. Rene Pelletier (MON '45) has been named chief of the clinics and member of the school council succeeding Dr. L. A. Gendreau, who resigned recently. Dr. Pel-

letter worked with the Department of Sanitation in Saint Hyacinthe after receiving his veterinary degree and in 1947 entered private practice. When the veterinary medical school was established in Saint Hyacinthe, he accepted the position of professor and clinician, the position he held until his recent promotion.

Dr. Henri Paul Girouard (MON '52) has been named clinician of the large animal hospital at the school. He has been in private practice since receiving his veterinary degree.

University of Illinois Appoints Three to Zoonoses Center

The College of Veterinary Medicine, University of Illinois, has recently announced the appointments of Dr. Leroy Fothergill, Dr. Shyamal Sinha, and Professor Harold Hannah to the Illinois Center for Zoonoses Research.



Dr. Leroy
Fothergill



Dr. Shyamal
Sinha



Prof. Harold
Hannah

Dr. Fothergill, an authority in epidemiology, has been named associate director of the Center for Zoonoses Research. He received his M.D. degree from Harvard Medical School in 1929 and taught there until he became head of the Department of Epidemiology at the Naval Medical School in Bethesda, Md., in 1941.

In addition to his appointment with the Zoonoses Research Center, Dr. Fothergill is scientific advisor to the commanding officer of the U.S. Army Chemical Corps Biological Laboratories at Fort Detrick, Md. He recently received the Army's Outstanding Performance Award for his work.

Dr. Sinha (PHI '50) has been appointed senior member of the Center for Zoonoses Research. Dr. Sinha came to the United States from India and attended the Univer-

sity of Wisconsin where he earned his M.S. and Ph.D. degrees in veterinary medicine. He served as a director of a regional diagnostic laboratory, and later as director of biological research at Jensen-Salsbury Laboratories, Inc., before joining the University of Illinois faculty.

Professor Hannah has accepted appointment as half-time professor of veterinary medical law in the College of Veterinary Medicine.

After receiving his B.S. degree in agriculture and his LL.B. from the University of Illinois in 1935, he served in various capacities at the College of Agriculture until 1941. He then entered military service for four years.

Upon his return to the University of Illinois, Professor Hannah taught courses in agricultural law and, in 1954, he became associate dean of the College of Agriculture. He then went to India and worked with other educators in planning the Uttar Pradesh Agricultural University in Northern India. When he returned in 1957, he continued his duties as associate dean until 1959. At present, he is professor of agricultural law and veterinary medical law.

Dr. L. C. Murphy Joins Virology Research Resources Branch, PHS

Dr. Leslie C. Murphy (WSU '39), formerly chief, Branch IV, VR Division, Biological Laboratories and staff veterinarian, Fort Detrick, Md., has been appointed to the staff of the new Virology Research Resources Branch of the Public Health Service's National Cancer Institute, Bethesda, Md.

Dr. Murphy, a lieutenant colonel in the Veterinary Corps, has been assigned by the Army to the Institute for three years. He will assist Dr. Robert Holdenreid in directing a program to develop experimental animals whose viral and genetic components are known, and special housing facilities for these animals that will prevent viral contamination. Initial contracts have been awarded for the production of virus-defined mice and for identification reagents for the mouse viruses. Steps will be taken to make primates available for virus-cancer research.

Dr. Murphy joined the Veterinary Corps, U.S. Army, in 1940. In addition to his tour

of duty at Fort Detrick, he served at such posts as Fort Benning, Ga., Ninth Service Command Laboratory, Hawaii, and Fort Sam Houston, Texas. In 1949-1950 he was assigned for one year to the Rockefeller Institute for Medical Research in New York. From 1953 to 1958 he served at various times as chief of Veterinary Virology and Bacteriology Departments, Walter Reed Army Institute of Research, Walter Reed Army Medical Center, Washington, D.C.

Dr. Murphy is currently serving as co-chairman of the AVMA Section on Public Health.

from 1954 up to the past few months. It emphasized market cattle testing, milk-ring testing, calfhood vaccination, and sanitation.

Features added to the exhibit were a map of the counties in Kansas depicting the area modified certification program to date, and a portable projector for showing slides of sheep scabies.

Circulars and bulletins were available and were picked up by the hundreds of fair visitors who stopped by the exhibit.

This brucellosis exhibit was also shown at the Kansas State University Veterinary Medicine Open House, Oct. 28, 1961.

Brucellosis Exhibit Shown at Two Kansas Fairs

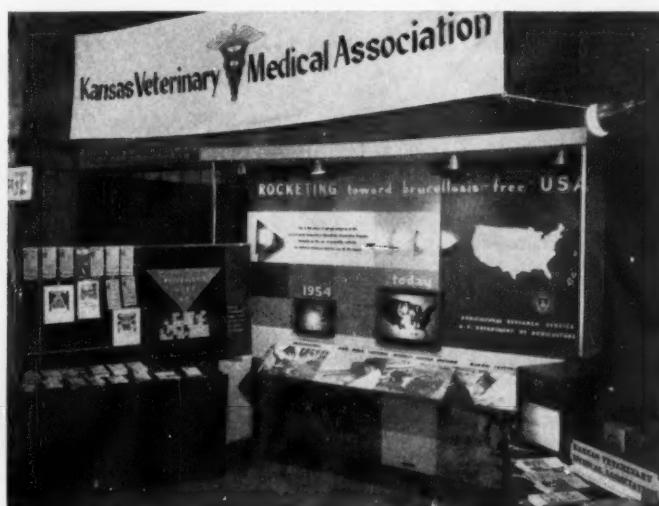
The Kansas State V.M.A. in cooperation with Dr. David O. Manley (KSU '41), chief veterinarian in charge of USDA Animal Disease Eradication activities in Kansas, presented an exhibit, "Rocketing Toward a Brucellosis Free U.S.A.," at the Mid-American Fair at Topeka, Kan., on September 9 through 14, and at the Kansas State Fair at Hutchinson, Kan., on September 16 through 21.

The exhibit, loaned by the USDA, displayed the progress of the cooperative state-federal brucellosis program in the United States

Swine Diseases Discussed at Short Course

A special short course on swine diseases was held recently at Tifton Station, Ga. It was sponsored by the Coastal Plain Experiment Station and the South Georgia V.M.A. Approximately 130 veterinarians attended.

Attention at the short course was focused on hog cholera. Drs. Howard Dunne (ISU '41), University of Pennsylvania, and Dr. William L. Sippel (UP '40), Kissimmee, Fla., outlined the problems of diagnosis and control of the disease.



This exhibit was shown by the Kansas State V.M.A. at two major Kansas fairs recently. It stressed market cattle testing, milk-ring testing, calfhood vaccination, and sanitation. Literature was distributed at the booth.

Deaths

Star indicates member of AVMA

***Lister A. Burkey** (OSU '14), 69, Sugar Creek, Ohio, died of cancer May 4, 1961. Dr. Burkey was a general practitioner.

Thomas Childs (ONT '15), 73, Calgary, Alta., died Oct. 3, 1961.

In 1946 Dr. Childs was appointed director general of the federal veterinary service in Canada. He controlled a nationwide disease testing program which reduced tuberculosis in livestock in Canada by 50%, and began the federal-provincial brucellosis control plan for the detection and prevention of the disease. In 1952 he helped coordinate efforts to control a foot-and-mouth disease epizootic in Canada.

Dr. Childs served as president of the U. S. Livestock Sanitary Association in 1952.

Bert E. Farley, 81, Exeter, Calif., died Oct. 11, 1961.

James C. Glenn (CVC '07), 80, Independence, Iowa, died Oct. 5, 1961.

Although Dr. Glenn had retired from his general practice in Norway, Iowa, he was still active in federal poultry inspection work. He served as president of the Eastern Iowa V.M.A. in 1927 and later as president of the Iowa V.M.A.

William M. Hickman (CIN '18), 73, Covington, Ky., died Oct. 17, 1961.

Dr. Hickman was a small animal practitioner.

***Maxwell Maughon** (AUB '51), 39, Sparta, Tenn., died Oct. 17, 1961.

Dr. Maughon was a general practitioner.

***Thomas J. Muxlow** (KSU '30), 54, died Sept. 21, 1961.

Dr. Muxlow was a federal veterinarian and practitioner in South St. Paul, Minn., since 1932.

George W. Northstrum (MCK '10), 74, Crystal Falls, Mich., died Oct. 12, 1961.

Dr. Northstrum had practiced in Crystal Falls for 50 years.

Ira Pope (UP '11), 71, Elizabeth, N.J., died of a heart attack Aug. 23, 1961.

Dr. Pope was a retired small animal practitioner.

***Donald W. Pratt** (ISU '43), 41, Red Oak, Iowa, died in May, 1961.

Dr. Pratt was a small animal practitioner.

***Harry B. Risley** (COR '09), 75, Bethlehem, Conn., died July 11, 1961.

He was known for his interest in horse ailments, and he served as a veterinarian at many harness horse tracks in the East for a number of years. He maintained a practice in Bethlehem with his son, Dr. Harry B. Risley, Jr. (COR '41).

Abram W. River (MCK '09), Riceville, Iowa, died July 16, 1961.

Roy W. Rutherford (KCV '10), 73, Dallas, Texas, died April 28, 1961, from cerebral hemorrhage.

Dr. Rutherford retired in 1956. He had been active in practice and health department work.

***John E. Sawyer** (COR '40), Windsor, Vt., died June 9, 1961, of a coronary condition.

Burg Waddill (COL '25), 63, Monroe, La., died Sept. 9, 1961.

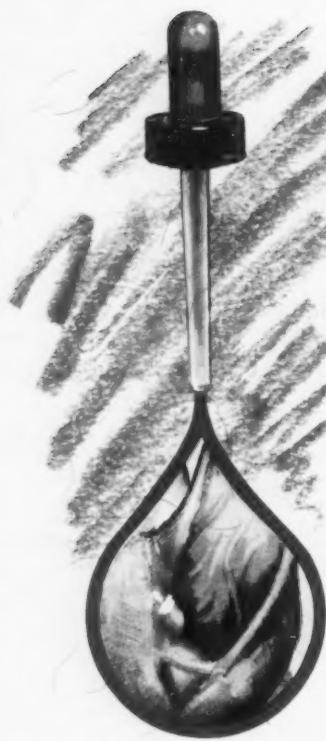
Dr. Waddill was veterinarian for the Fair Grounds race track in New Orleans for 22 years and was also a small animal practitioner there.

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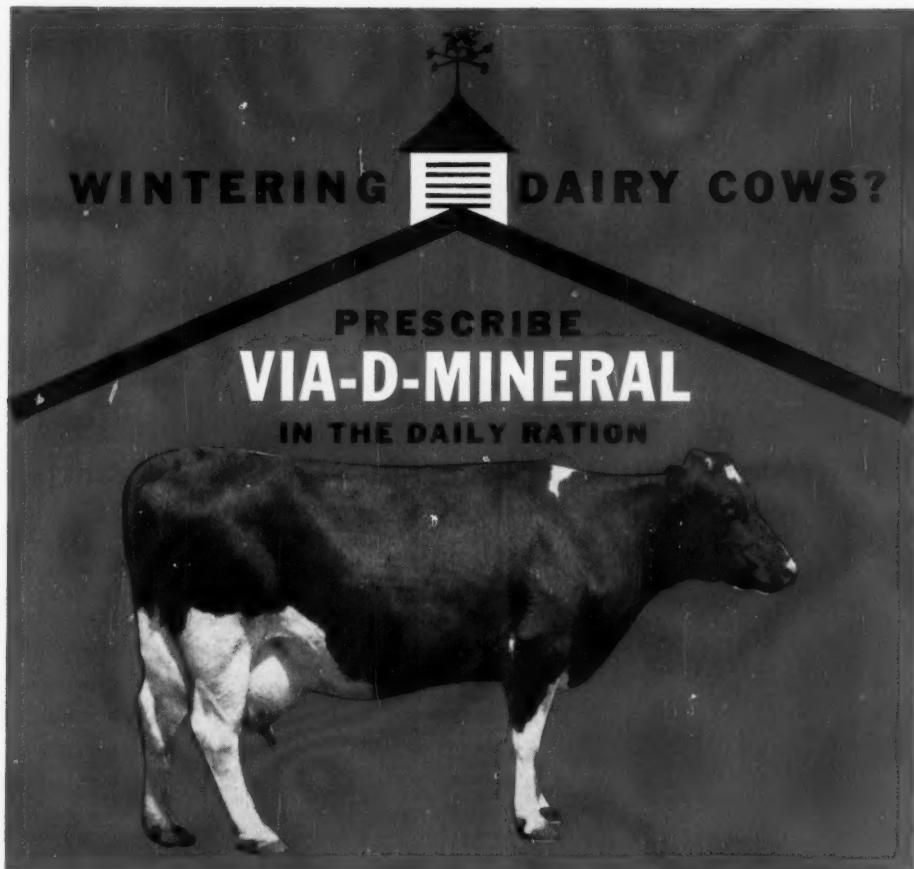
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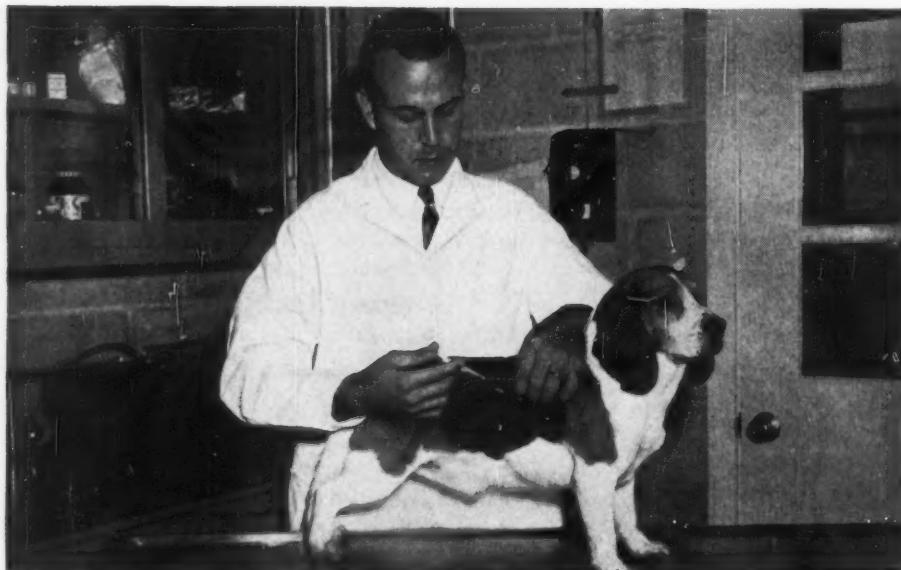
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	Pretreatment	Post		
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3.4	3100	0	0	100
3.4	8200	0	0	100
3.4	2100	0	0	100
3.4	2300	0	4 dead	100
3.4	1800	0	8 dead	100
0	2900	—	41	0

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Dose D.N.P. milligrams per pounds body weight	Eggs per gram feces		Worms at Necropsy	Per cent Reduction
	Pretreatment	Post		
3.4	7	0	0	100
4.5	11	0	0	100
0	8	12	35	0

DOGS INFECTED WITH ANCYLOSTOMA CANINUM

Number dogs	Mg. D.N.P. per pound	Range Eggs per gram feces		Worms at Necropsy	Per cent Reduction
		Pretreatment	Post		
2	1.1	44-46	10-13	21-41	9-55
10	2.3	29-29	0-1	0-12	84-100
9	3.4	29-73	0-2	0-1	97-100
2	4.5	33-35	0	0	100



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A single subcutaneous injection of D.N.P. usually results in a 100 per cent kill of adult hookworms. Dosage is 0.1 c.c. per pound of body weight. D.N.P. is primarily effective against adult hookworms.

Precautions

Do not repeat treatment within 14 days. A fecal examination should be made two to four weeks following initial treatment. Periodic fecal examinations should

be made because of the possibility of re-infestation.

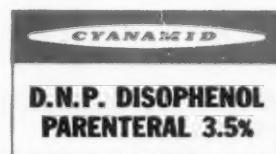
It is also desirable to use supportive therapy in puppies with severe anemia resulting from heavy hookworm infestation.

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Veterinarians have reported on the treatment of 671 dogs with D.N.P. These dogs weighed one-half to 112 pounds, ranged in age from 2 days to 13 years and included pregnant bitches. No reactions from D.N.P. were reported. Veterinarians reported that 88.2% of 671 dogs, treated with one subcutaneous dose of D.N.P., were free of hookworm eggs and 10% showed significant reduction of hookworm eggs on posttreatment fecal examination.

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The results of four laboratory trials with D.N.P. are shown at the left. Veterinary Professional Service Department, American Cyanamid Company, Princeton, New Jersey.





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Vol. 139

No. 12

December 15, 1961

Journal

OF THE
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Arteriography of Bone Lesions in Cats and Dogs

Roy K. Imhoff, D.V.M., and Bruce H. Ewald, D.V.M.

DIAGNOSIS of bone tumors by their clinical and radiologic manifestations is often uncertain. Biopsy is occasionally hazardous, and the delay in obtaining a confirmatory histopathologic diagnosis may be undesirable for the private practitioner. However, arteriography using injection of radiopaque contrast medium into a peripheral artery may serve as an additional aid in diagnosis of bone lesions. It permits differentiation of benign and malignant bone changes of the long bones and pelvis. Arteriography is not a substitute for a histopathologic diagnosis.^{1,4} Arteriography was used as a diagnostic aid in 12 dogs and cats with bone lesions. Six cases are reported here.

The injection of radiopaque contrast medium into an artery in an attempt to evaluate the vascular architecture of a bone tumor was first described in 1932.³

The application of arteriography was later demonstrated in differentiating malignant from inflammatory bone lesions.^{4,5} Since then, this technique has been used in man with increasing frequency as a clinical diagnostic aid.^{1,7,9,10}

From the Animal Medical Center, New York, N.Y. Dr. Imhoff is now a small animal practitioner, Foster Animal Hospital, Clifton, N.J.; Dr. Ewald is now a small animal practitioner in New York City.

Methods and Materials

The patient is anesthetized. Either the medial surface of the humeroradial region or the proximal femoral region is prepared for surgical entry, since catheterization of the brachial or femoral artery is necessary. The brachial artery is isolated by blunt dissection after incising the skin just proximal to the humeroradial joint. At this point, the artery lies between the biceps brachii muscle anteriorly and the distal end of the femur posteriorly.¹² The femoral artery is exposed in the proximal femoral canal. In either location, the fascia is stripped from the artery for a distance of 3 to 4 cm. and two lengths of silk suture material are placed under the vessel 2 cm. apart. Pressure is applied by traction on the silk loops to control the flow of blood. The vessel is longitudinally incised between the silk loops and a catheter is inserted. Polyethylene tubing (size PE 60 to PE 120)* which has been sterilized in a quaternary ammonium solution for 24 hours is used as the catheter.

When the lesion is proximal to the vascular incision, the catheter is passed proximally for a retrograde injection. If the lesion is distal to the vascular incision, the catheter is passed distally for 2 cm. In the case of an intrapelvic tumor (Fig. 3), the catheter is inserted into the femoral artery and then into the aorta. One silk loop is tied around the artery and the polyethylene tubing, without occluding the lumen of the catheter. The other silk loop is tied around the artery to stop the blood flow. A syringe is attached to the free end of the catheter for the in-

*Clay-Adams, Inc., New York, N.Y.

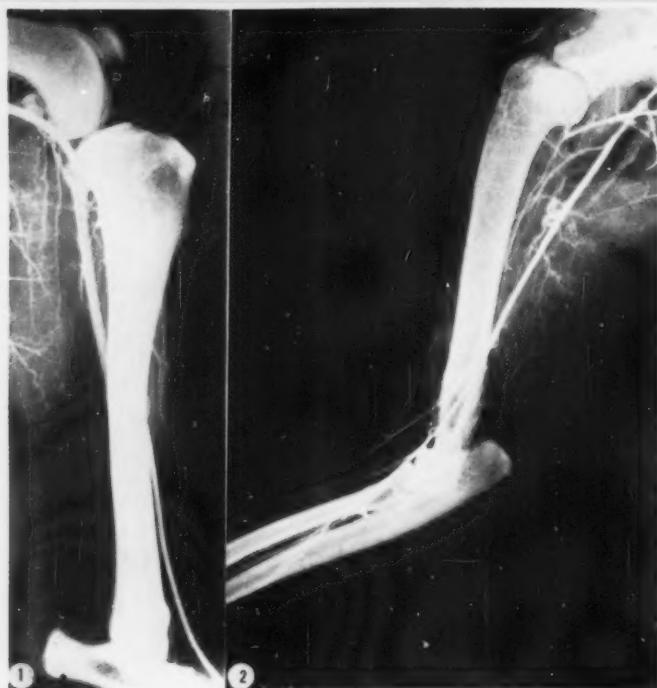


Fig. 1—Normal femoral arteriogram of dog.

Fig. 2—Normal brachial arteriogram of cat.

jection of the radiopaque contrast medium. The preferred contrast medium is diatrizoate sodium.* Cats and small dogs weighing less than 10 lb. are given 3 cc.; dogs 10 to 40 lb., 4 cc.; dogs over 40 lb., 5 to 6 cc. The contrast medium is forcefully injected into the artery and a radiograph is taken immediately. A second radiograph is taken approximately five seconds after the injection. The catheter is removed, the vessel is ligated, and the skin sutured. Permanent ligation of the vessel does not alter the function of the limb⁵ because of rapid establishment of collateral circulation.^{5,6}

The first radiograph demonstrates the arterial phase of the lesion; the second illustrates the venous phase (Fig. 6 and 7). An automatic serigraph is not necessary for arteriography.¹² One radiograph taken during the arterial filling of the lesion and one during the venous filling as described above are adequate to show any abnormalities. Both radiographs should be taken to demonstrate the rapid venous filling usually observed in the malignant tumor.¹²

*Hypaque 50%, Winthrop Laboratories, New York, N.Y.



Fig. 3—Radiograph of pelvis of cat with osteogenic sarcoma (case 1).

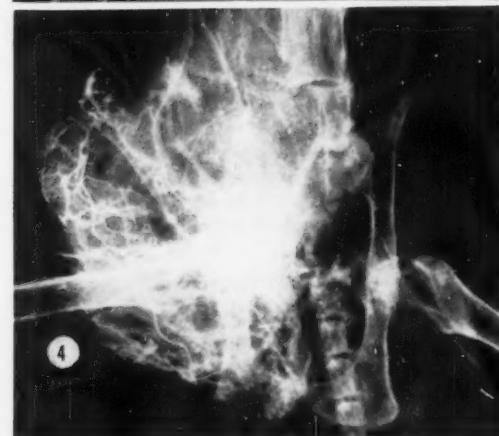


Fig. 4—Arteriogram (case 1) illustrates tortuosity of vessels and accumulation of contrast medium.



Fig. 5—Radiograph (cat, case 2) of affected humerus with fibrosarcoma.

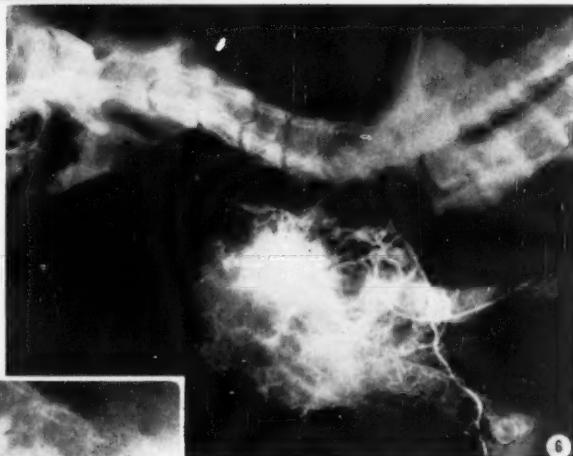


Fig. 6—Brachial arteriogram (case 2) taken immediately after injection demonstrates concentration of contrast medium in terminal dilatations of vessels.



Fig. 7—Arteriogram (case 2) taken seven seconds after injection. There is retention of contrast medium in the tumor area.



Fig. 8—Radiograph (dog, case 3) of left proximal humerus with osteogenic sarcoma.

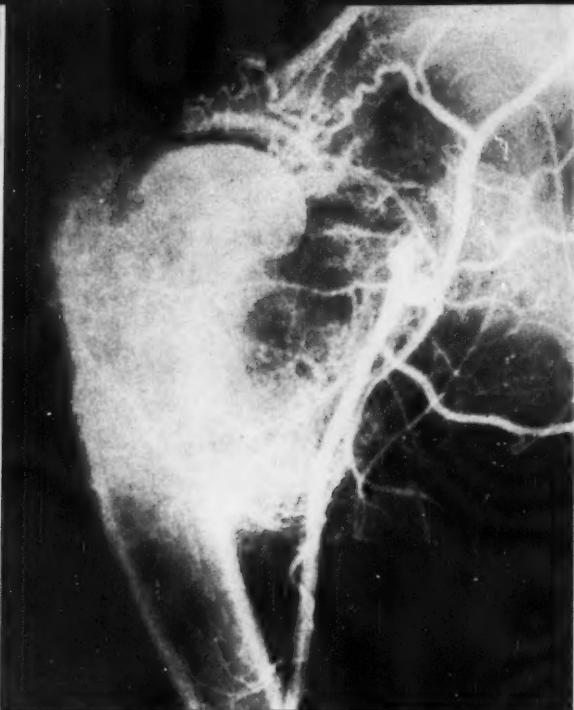


Fig. 9—Brachial arteriogram (case 3) of left proximal humerus. There is increased vascularity and tortuosity of vessels.

Case Reports

Case 1.—A male domestic cat, 7 years old, had a large, firm swelling in the area of the right ilium and was paraplegic. A radiograph (Fig. 3) and an arteriogram (Fig. 4) showed an extensive osteolytic lesion involving the sixth and seventh lumbar vertebrae, the sacrum, and the right ilium. Euthanasia was performed, and the histopathologic diagnosis was osteogenic sarcoma.

Case 2.—A male domestic cat, 9 years old, was lame in the left foreleg. A firm swelling was palpable in the shoulder area. A radiograph (Fig. 5) and an arteriogram (Fig. 6) showed osteolysis of the proximal humerus. Euthanasia was performed, and the histopathologic diagnosis was fibrosarcoma.

Case 3.—A female Boxer, 6½ years old, had been lame in the right foreleg after a fall two weeks prior to examination. No swelling was palpable, but pain was evident when pressure was applied in the shoulder area. After a radiograph (Fig. 8) and arteriogram (Fig. 9) were taken, euthanasia was performed. The histopathologic diagnosis was osteogenic sarcoma.

Case 4.—A male domestic cat, 8 years old, had a history of progressive swelling of the right tarsus after traumatic injury six weeks previously. A radiograph (Fig.

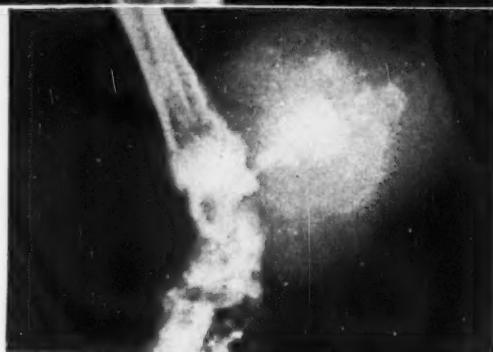


Fig. 10—Radiograph (cat, case 4) of right tarsus. There is osteolysis of the tuber calcis. This is a case of fibrous dysplasia of bone.



Fig. 11—Femoral arteriogram (case 4) demonstrates increased vascularity in the tumor area.



Fig. 12—In femoral arteriogram (dog, case 5), there is a normal arterial pattern with deviation of the main artery around the tumor. This is multiple enchondroma.

Fig. 13—Radiograph (dog, case 6) demonstrates osteolysis of left carpus; the right carpus is normal.

Fig. 14—In brachial arteriogram (case 6), there is slight increase in vessels in the carpus but vascular architecture remains normal.

10) showed osteolysis of the tuber calcis. A femoral arteriogram (Fig. 11) indicated a malignant bone tumor, and euthanasia was performed. The histopathologic diagnosis was fibrous dysplasia of bone with many giant cells.

Case 5.—A male Toy Poodle, 1 year old, had multiple bony enlargements on the bones of the limbs. The lesion studied by arteriogram (Fig. 12) involved the left distal tibia. A biopsy of the lesion was taken. Histopathologic diagnosis was multiple enchondroma. One year later, the size of these lesions had not changed noticeably.

Case 6.—A male Miniature Poodle, 8 months old, was lame in the left foreleg, with pain in the carpus, for four weeks. A radiograph (Fig. 13) showed rarefaction of bone in the left carpus. A biopsy was not taken due to the possibility of trauma to the carpal area, but an arteriogram (Fig. 14) was performed. A diagnosis of osteomyelitis was made by arteriography, and antibiotic therapy was instituted. Remission of clinical signs was obtained in 14 days.

Discussion

It has been reported that minute periosteal vessels assume the function of nutrition of long bones and that the nutrient artery is probably vestigial.¹⁰ Circulation within normal bone cannot be demonstrated by conventional arteriography. Therefore, appearance in the arteriogram of any vessels leading to and entering bone can be considered as an indication of a disease process.¹⁰ By special arteriographic methods, it was demonstrated that flow of blood via the nutrient artery to the diaphysis of the tibia indicates that the vessel has some function in the nutrition of this bone.

Arteriograms of malignant bone tumors show¹¹ (1) an increase in vascularity to the affected area indicating newly formed vessels; (2) early venous return of the contrast medium suggesting arteriovenous shunts in the tumor (the veins proximal to the tumor are opacified before the veins distal to the tumor); (3) deviation and tortuosity of the main artery or branches

in the vicinity of the tumor; (4) retention of radiopaque medium in the tumor area, and terminal dilatations of vessels especially in the second radiograph taken during the venous phase. The "pathologic vessels" that pass through the malignant tumor are lined by tumor cells.¹⁴ Such vessels terminate in areas of necrotic tumor tissue, causing "tumor lakes" that remain full of contrast medium for long periods. There is no residual elasticity in the walls to aid expulsion of the contrast medium.

In contrast to malignant lesions, most benign tumors are relatively avascular.⁵ The arteriographic appearance of the benign lesion is the same as the normal bone except for a mechanical displacement of the vessels by the bulk of the tumor. Malignant bone tumors may be distinguished from inflammatory lesions such as osteomyelitis. Osteomyelitis is associated with simple hyperemia and the arterial pattern retains an orderly and regular arrangement with successive branches of gradually decreasing diameter. The greater the activity of the tumor, the greater is the new formation of vessels and the more rapid the filling of the veins.¹⁵

In the case of one bone lesion in a cat (Fig. 10 and 11), a diagnosis of malignant bone tumor was made by arteriography. Subsequent histopathologic diagnosis was fibrous dysplasia with giant cells. A remarkable increase in the size of the regional vessels occurred in this benign lesion.⁶ Most benign bone lesions retaining contrast medium have one thing in common, giant cells.¹¹ A benign bone lesion containing giant cells may, therefore, appear similar to a malignant lesion on arteriography.

In man, arteriography is of value in the following circumstances:¹⁶ (1) deciding if the lesion is malignant or benign, (2) defining the extent of the lesion before surgery or x-ray therapy, (3) determining the soft tissue involvement around the bone tumor, and (4) determining the onset of malignancy in a tumor previously thought to be benign.

In animals, this technique has an added value in deciding whether to advise euthanasia.

Arteriography has certain disadvantages: (1) the necessity of a general anesthetic, (2) inaccessibility of the main artery for catheterization due to anatomical distortion by the tumor, and (3) the character of

the tumor may not be distinguishable through arteriography.

Summary and Conclusions

Four types of bone lesions were used to illustrate the application of arteriography: 3 malignant tumors, 1 benign tumor, 1 case of osteomyelitis, and 1 case of fibrous dysplasia of bone.

Arteriography may be used as an aid to diagnosis of bone lesions, mainly to differentiate malignant from benign bone changes. However, histopathologic diagnosis is still necessary to classify the tumor and to confirm the diagnosis.

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Evaluation of a Cerumenolytic Agent for Small Animals

Nyles Van Hoosen, D.V.M., and Howard E. Bean, D.V.M.

OTITIS EXTERNA in small animals often is complicated by excessive or impacted cerumen. Removal of cerumen and accumulated debris is necessary to permit ventilation and topical treatment. Removal itself is at times a therapeutic or prophylactic measure. Mechanical methods of cleaning the aural canal often require anesthesia of the animal and may result in additional trauma.

The purpose of this report is to present a clinical evaluation of a cerumenolytic agent for effective yet rapid, painless, andatraumatic cleansing of excessive or impacted cerumen from the external auditory canal.

Materials and Methods

A series of 201 small animals (141 dogs, 59 cats, and 1 rabbit) with clinical signs of otitis externa or excessive wax was treated with a cerumenolytic agent.* Where there was parasitic infestation or bacterial infection, this was adjuvant to therapy for the primary condition. Among the dogs, 25 breeds and combinations of breeds were represented (80 males, 61 females, ages ranging from 10 days to 16 years; 38 were 6 months old or less). Of the total, 95 were droop-eared, 46 had erect or cropped ears. Among the droop-eared dogs, 47 were Poodles or other Spaniel breeds. Of the 59 cats (35 males, 24 females), 50 were of domestic or mixed breeds, 4 were Persian, and 5 Siamese. Their ages ranged from 4 weeks to 14 years; 9 were 3 months old or less.

The cerumenolytic agent used was essentially similar to one used by physicians for removing wax from human ears.^{1-3,5} It contains 10% triethanolamine polypeptide oleate-condensate in propylene glycol with 0.5% chlorbutanol. The protein component of cerumen is softened and dispersed by the polypep-

tide linkage, whereas the oleate-condensate partially liquifies the lipid component. The plugs of earwax and waxy debris are thus softened and made water-miscible. They then are easily flushed out with water. The antibacterial agent (chlorbutanol) insures the sterility of the solution and minimizes the likelihood of accidental contamination.⁵ The medication has been reported effective for small animals in a preliminary clinical screening study.⁴

The cerumenolytic agent was instilled by dropper into the affected ears, which in some cases were stoppered with cotton plugs for periods ranging from three to ten minutes to overnight. The amount instilled was sufficient to fill the available space in the ear canal. In most animals, the dispersed cerumen, together with the agent, was expelled by mere shaking of the head. In the few animals in which otoscopic examination revealed the necessity, the ear was flushed with water. Where indicated, topical treatment with antibiotics or parasiticides followed the cerumenolysis. When necessary, treatment was repeated up to ten times, at intervals ranging from a few hours to a week (Table 1). The first treatment in all animals was administered by the investigators in their clinics. In about half the animals in which more than one instillation was necessary, succeeding treatments were given by the owners at home, under direction. Final examination for results was made by the investigators in all cases.

The extent of removal of wax or exudate, the presence or absence of side-effects, the attitude of the animal, and the attitude of the owner were used as criteria in evaluating results. Complete removal of wax or exudate with minimal side effects was graded excellent. When the removal was substantial but not complete, the result was graded good. When side effects were more extensive, or wax or exudate removal minimal, the result was graded fair. Where no appreciable improvement in the condition was effected, the result was graded poor.

Results and Comment

The results obtained for dogs and cats were similar. Results were rated excellent for 109 (77.0%) of the dogs and for 45 (76.0%) of the cats; good for 21 (15.0%) of the dogs and 9 (15.0%) of the cats; fair for 5 (4.0%) of the dogs and 4 (7.0%)

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*Cerumenex-V, Drugs for Veterinary Medicine, Inc., New York, N.Y.

TABLE 1—Number of Therapeutic Instillations Employed and Results

No. of instillations	Dogs					Cats					Rabbit	
	No.	E*	G	F	P	No.	E	G	F	P	No.	E
1	65	61	3	1	...	31	25	4	2	...	...	...
2	29	20	6	1	2	16	13	1	1	1	...	...
3	25	15	9	1	...	4	3	...	1	...	...	...
4	7	4	1	1	1	4	2	2	...	...	...	...
5-10	15	9	2	1	3	4	2	2	...	...	1	1
Total	141	109	21	5	6	59	45	9	4	1	1	1

*E = excellent results, G = good results, F = fair results, P = poor results.

of the cats; poor for 6 (4.0%) of the dogs and for 1 (less than 2.0%) of the cats (Table 2). Complete or substantial removal of wax was effected in 92.0% of the dogs and cats.

In a majority of the dogs (88) and cats (42), only 1 or 2 instillations were required to produce good or excellent cerumenolytic results.

Dogs.—Details of pathologic findings and results of treatment of the dogs are shown (Table 2).

Among the dogs in which results were excellent were 4 Poodle pups 10 days old with dark ceruminous discharges which were cleared by single instillations of the cerumenolytic agent. From a 16-year-old Shepherd-type dog with acute purulent otitis, medium thick wax was completely removed with a single instillation.

Excellent results were obtained with a Scottish Terrier 3 years old with chronic otitis externa, whose condition had previously been relieved only temporarily with the use of other medications. He was given 10 instillations of the cerumenolytic agent over a three-week period. The condition cleared without other therapy, and there was no recurrence at an examination six weeks later. In this dog, the treatment

probably avoided the necessity of surgical intervention.

In a Belgian Sheepdog with chronic otitis externa, the cerumenolytic agent was used with excellent results in a single instillation for preoperative cerumenolysis. Six instillations given in a single day may have indefinitely delayed the necessity of surgical intervention for a Cocker Spaniel with an ear cancer of long duration which was bleeding, suppurating, and causing pain.

In a Cocker Spaniel with chronic otitis and polyps, almost complete elimination of excess cerumen made necessary surgery much easier. In another case, in which surgery for polyps was recommended to the owners, the cerumenolytic agent appeared to afford some immediate relief of pressure in the ear canal of a West Highland White Terrier. Results were rated as good and fair, respectively, in these cases.

At least 50% improvement was obtained by 2 instillations over a two-week period in a dog with aural parasites and much tissue granulation of the ear canal from previous surgery for chronic otitis. The cerumenolysis made treatment with acaricidal drugs more effective and less irritating.

TABLE 2—Results of Therapy with a Cerumenolytic Agent in 141 Dogs, 59 Cats, and 1 Rabbit

Clinical findings	Dogs					Cats			Rabbit		Total all animals					
	Total No.	E*	G	F	P	Total No.	E	G	E	P	Total No.	E	G	F	P	
Excess or impacted cerumen	76	65	8	3	...	11	9	1	1	...	...	87	74	9	4	...
Presence of parasites	14	12	2	...	...	35	32	3	...	...	1	1	50	45	5	...
Presence of infection	44	29	8	2	5	4	3	...	1	...	...	48	32	8	3	5
Parasites and infection	7	3	3	...	1	9	1	5	2	1	...	16	4	8	2	2
Totals	141	109	21	5	6	59	45	9	4	1	1	201	155	30	9	7

*E = excellent results, G = good results, F = fair results, P = poor results.

Poor results were obtained in a Cocker Spaniel, a Labrador Retriever, and a Puli, all with ulcers; in a Springer Spaniel and a Cocker Spaniel with purulent otitis externa and a soft, purulent discharge; and in a Springer Spaniel with a combination of chronic purulent otitis externa and otitis media.

Among the 47 Spaniels, there were 20 in whom clinical signs indicated only excessive or impacted cerumen; results in 17 were excellent, in 3 good. In 7 with ceruminosis and parasites, results were excellent for 5, good for 2. In 17 with infection and ceruminosis, but no parasites, results were excellent in 10, good in 3, fair in 1, and poor in 3. Three dogs had a combination of impacted wax, parasites, and infection, and for these the results were divided evenly among excellent, good, and poor.

Reactions which could be called side effects of the treatment were observed in only 3 dogs. In the aforementioned Puli, the manipulation necessary for instillation caused pain to the ulcerated ear. In a West Highland White Terrier, pain was evidenced at the first instillation, decreasing over 4 treatments in nine days and disappearing by the ninth day. Results, however, were good. A Llewellyn Setter with acute otitis shook his head for several hours after the instillation, and his ear canals became slightly reddened. In this dog, a single instillation was sufficient to remove the cerumen and permit topical treatment. The apparent pain disappeared the next day.

Cats.—Details of pathologic findings and results for the 59 cats in the study are given (Table 2).

One cat with dry, crusted exudate and acutely inflamed ears was given 3 instillations of the cerumenolytic agent over a ten-day period with excellent results. This was the longest period any of the cats was under treatment. Another, with a bilateral purulent otitis and accompanying vertigo, was given 8 treatments in eight days, also with excellent results. As an adjunct to treatment of chronic otitis externa, 7 instillations were given to another cat in seven days prior to topical medications. Results were excellent.

Good results were obtained in a cat with otitis externa and otitis media, given 6 instillations in two days. Five instillations in five days yielded good results in a cat

with a hard, impacted wax plug; vertigo caused by the impacted cerumen cleared concurrently with the cleansing of the ears. After a single instillation, results were excellent in a cat whose balance was affected and whose left ear canal was filled with a hard, ceruminous plug. In a cat, whose external ear canal was almost closed by scar tissue from a bite wound and in which there was a ceruminous discharge, excellent relief was obtained from 4 instillations in four days.

The most intensive treatment in the series, 6 instillations in two days, was given with good results to a cat with otitis media, with infection and parasitic infestation of the external ear in addition. In another, the entire mass of hard wax and detritus caused by an infestation of ear mites was squeezed out like toothpaste three minutes after a single instillation.

In a cat with results rated fair, there was apparent pain from manipulation of the ears for a single bilateral instillation of the cerumenolytic agent for removal of a thick, malodorous yellow discharge. In a cat with both otitis externa and otitis media, also graded fair, the cerumenolytic agent was useful in flushing out a moist gray exudate from its ear in preparation for treatment with antibiotics. Three instillations were made in three days.

A 14-year-old tomcat with a creamy exudate from both ears and clinical findings of infection and parasitic infestation was the only cat in which results were poor.

Side effects were observed in only 6 cats. These consisted of violent head shaking and scratching for twenty minutes to two hours after instillation of the cerumenolytic agent.

Rabbit.—A pet rabbit 18 months old had hard cerumen packed in both ears and parasitic infestation. Five instillations of the cerumenolytic agent in five days afforded progressive relief, with an excellent outcome.

Comment.—As adjunctive therapy, to clear the aural canals of small animals in preparation for direct treatment of the condition, the preparation worked best in animals in which the material to be flushed out was more waxy than purulent. Liquefaction of a soft, purulent exudate, in some cases, had no particularly beneficial result. In a number of animals in which there was infection or parasitic infestation, the debridement of the ear canal, and the

consequent improvement of ventilation, obtained by the cerumenolytic treatment were sufficient to make further treatment unnecessary, and the underlying condition cleared without further medication. The treatment appeared painless in all animals except those whose physical condition rendered any manipulation of the ear painful. Anesthesia was unnecessary. No trauma was caused in any instance by the cerumenolytic process.

Summary

A series of 141 dogs, 59 cats, and 1 rabbit with clinical signs of otitis externa was treated with a cerumenolytic agent as an adjunct to therapy for infection or parasitic infestation and as total therapy when excess or impacted cerumen were the only clinical findings. Excellent or

good results were obtained in 92% of the patients treated. Side effects were minimal and transient.

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Effect of Passively Transmitted Antibody on Attempts to Immunize Pups Against Infectious Canine Hepatitis

Infectious canine hepatitis (ICH) antibodies are passed from an immune dam to her pups primarily in the colostrum. These antibodies decline in the pup at a seemingly regular rate; when the antibody titer drops below 10^{-2} the pup can be successfully immunized. Pups of infectious hepatitis-immune dams seem to reach this point when 5 to 7 weeks of age, dependent upon the immune status of the dam.

Dogs successfully vaccinated against ICH with a modified live-virus vaccine shed that virus in the urine in concentration enough to immunize contact controls; however, this secondary immunization is dependent upon the closeness of contact and is not a reliable means of immunization. Dogs successfully vaccinated maintain a high antibody titer against ICH for several years.

A dam that has been through an attack of infectious hepatitis, perhaps inapparent, and which may have a high antibody titer against the disease may still shed virulent virus in the urine. Such a dam could conceivably pass virulent virus to her pups before the ingested colostral antibodies have reached their maximal concentration or have reached the susceptible tissues. The pups could die of infectious hepatitis within the first 2 or 3 days of life even though the dam is apparently immune to infectious hepatitis. This factor needs further investigation.—R. L. Ott, D.V.M., at Annual Conference of Veterinarians, Urbana, Ill., Oct. 19-20, 1961.

Emergency Tracheotomy in the Dog

John L. Durr, D.V.M., M.S.

TWO METHODS are available for correction of respiratory obstruction. These are the removing of the existing cause or the bypassing of the site of the obstruction for the purpose of establishing and maintaining a patent airway. Obstruction of the upper respiratory tract occurs with a variety of diseases and conditions, such as acute infections, foreign bodies, tumors, trauma, and acute edema of the larynx of an allergic nature or due to inhalation of smoke or hot air.

There are two types of tracheotomy, the orderly and the emergency. In most cases, the orderly tracheotomy can be performed. In doing so, respiratory difficulty is alleviated by passing an endotracheal tube into the trachea. This furnishes an airway and tracheotomy can be performed in an orderly manner. In cases of imminent asphyxia, emergency tracheotomy is necessary.

Tracheotomy is indicated when there are signs of impending asphyxia due to obstruction—restlessness of the animal, cyanosis, and labored breathing; in later stages of asphyxia—stupor, coma, or convulsions. There is little need for emergency tracheotomy if the signs of impending respiratory obstruction are known; however, such an emergency case is herein described.

History

On June 20, 1960, a 30-lb., Shepherd-type dog in a coma was admitted to the clinic. The owner stated that the dog had been playing in a fenced yard and had appeared normal until 30 minutes prior to arriving at the clinic. The first signs were restlessness, salivation, coughing, and labored breathing. Within 20 minutes after the onset of clinical signs, the dog's tongue was markedly enlarged, and a great deal of froth had accumulated around his

mouth. Just prior to the owner's arrival at the clinic, the dog had a convulsion and became comatose. By the time the dog was taken to a treatment room, breathing had stopped.

Treatment

Death due to asphyxia was imminent and, since the tongue was too badly swollen to permit insertion of an endotracheal tube, an emergency tracheotomy was performed with a pair of scissors. A tracheotomy tube was inserted, oxygen was given, and artificial respiration was started immediately. The dog began to breathe voluntarily five minutes after the tracheotomy was performed and a few minutes later had regained consciousness. Upon regaining consciousness, the dog began to struggle violently and was, therefore, anesthetized with sodium pentobarbital.

With the dog under general anesthesia, a thorough examination of the mouth and upper respiratory passages was made. The dog's tongue was swollen so badly it was impossible to see the larynx; however, digital examination and radiographs did not reveal any obstruction other than the swollen tongue.

The history of a sudden onset with little possibility of injury suggested that medical treatment should be directed at counteracting an allergic cause. Initial treatment consisted of 0.5 cc. of 1:1,000 epinephrine solution administered subcutaneously, 1.0 cc. of 1:500 epinephrine in oil administered intramuscularly, and 4.0 cc. of diphenhydramine hydrochloride* administered intravenously.

Over a six-hour period, 500 cc. of isotonic sodium chloride solution containing 100 mg. of hydrocortisone, 60 mg. of diphenhydramine hydrochloride, and 300 mg. of

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*Benadryl Hydrochloride, Parke, Davis and Co., Detroit, Mich.

neomycin sulfate was administered by intravenous infusion.

Edema of the tongue began to subside within four hours after treatment was begun and, within ten hours, the tracheotomy tube was removed and the incision closed.

Twenty-four hours after the onset of clinical signs, the dog appeared normal in every way; however, 10 mg. of diphenhydramine hydrochloride and 10 mg. of prednisolone were administered intramuscularly daily for four days in order to minimize the chances of recurrence. Neomycin sulfate, 150 mg., was administered intra-

muscularly twice daily for five days to control infection around the tracheotomy incision. The tracheotomy incision healed completely within ten days. There were no respiratory complications resulting from surgery.

Summary

Acute respiratory obstruction in a male Shepherd-type dog, apparently of allergic origin, was treated surgically by tracheotomy and with several antiallergic drugs. The dog recovered completely.

Reliability of a Drill Jig Employed in Toggle Pin Fixation of Femoral Head Luxations

IN 1953, an original surgical technique utilizing a drill jig for correction of recurrent luxation of the femoral head of the dog was described.¹ The operation involves replacement of the round ligament of the femoral head with fascia from the tensor fascia lata or with plastic anchored within the pelvic cavity on the toggle bolt principle. Success depends to a large extent on proper direction of the hole drilled through the femoral head and neck. For this reason, reliability of the drill jig as a guide for drilling through the center of the femoral head and neck was studied.

Materials and Methods.—The surgical approach to the hip joint described in the original article was employed in this experiment, as was the technique for using the drill jig, with one exception: a shallow "starter" hole was drilled in the trochanter major prior to final positioning of the drill jig. Canine cadavers weighing approximately 25 lb. each with intact hips were used in this study.

Each person taking part in this experiment had read the technique for using the drill jig and had satisfactorily explained its use to the author.

Five senior students used the drill jig ten times each in an attempt to guide the

drill bit through the center of the femoral neck and head, and three experienced small animal practitioners used the drill jig eight times each for the same purpose. A circle 2.5 mm. in diameter, the center of which was the point of attachment of the round ligament, was considered the center of the femoral head.

Results.—The center of the femoral head was pierced in 10 of 50 attempts (20%) by five students and in 8 of 24 attempts (33%) made by small animal practitioners. The point of emergence of the drill bit was off the articular surface of the femoral head 20% of the time when students did the drilling and 25% of the time when small animal practitioners did it.

Conclusions.—Results of this experiment indicate the drill jig is not a reliable guide for directing a drill bit through the center of the femoral head and neck of the dog. The principle of toggle pin fixation, however, seems useful.

By direct visualization of the femoral head and neck and without a drill jig, this technique for correcting luxation of the femoral head may be employed successfully and simply.—John L. Durr, D.V.M., M.S., is a small animal practitioner in Jackson, Miss. This report is from a thesis submitted June 3, 1960, by the author to the Graduate School of Auburn University in partial fulfillment of the requirements for the M.S. degree.

¹Knowles, A. T., Knowles, J. O., and Knowles, R. P.: An Operation to Preserve the Continuity of the Hip Joint. J.A.V.M.A., 123, (Dec., 1953): 508-515.



Officers for the United States Livestock Sanitary Association, Elected at Minneapolis, Nov. 3, 1961

Left to right—Drs. J. W. Safford, Helena, Mont., third vice-president; L. A. Rosner, Jefferson City, Mo., second vice-president; P. J. Grennan, Providence, R. I., first vice-president; and W. L. Bendaix, Richmond, Va., president.

United States Livestock Sanitary Association—1961

The 65th annual meeting of the U.S.L.S.A. was held at the Curtis Hotel, Minneapolis, Minn., Nov. 1-3, 1961, with president A. P. Schneider, Boise, Idaho, presiding.

Officers elected for the coming year are W. L. Bendaix (ONT '28), Richmond, Va., president; T. J. Grennan, Jr. (TEX '42), Providence, R.I., first vice-president; L. A. Rosner, (KSU '35), Jefferson City, Mo., second vice-president; John W. Safford (WSU '38), Helena, Mont., third vice-president; and Ralph A. Hendershott (OSU '17), Trenton, N.J., secretary-treasurer.

The meeting was attended by approximately 325 persons. Next year's meeting is scheduled to be held in Washington, D.C.

Excerpts from Meeting Reports

President's Address

A. P. Schneider, Boise, Idaho

The national brucellosis program has progressed in a most satisfactory manner. One state is now certified as brucellosis free and there are 84 brucellosis-free counties in 11 other states. Twenty-four states and Puerto Rico and the Virgin Islands have achieved modified certified status, and there are 2,191 modified certified brucellosis-free counties. Therefore, there is a total of 2,275 certified and modified counties or 72.1% of all counties in the nation. Additionally, 306 counties are conducting area work leading to certification for a

grand total of 2,581 participating counties, or 81.88%.

Some diseases once considered exotic are now taken for granted in this country. Examples of diseases listed as exotic in 1954, but now well established here, are bluetongue, enzootic abortion, and scrapie of sheep, and Newcastle disease of poultry.

Some recommendations of the president:

- 1) Results of the findings of the Committee on Federal Program and Policy should be put to greater use.



Newly installed president of U.S.L.S.A., Dr. W. L. Bendix, of Richmond, Va. (left), gets congratulatory handshake from outgoing president Dr. A. P. Schneider of Boise, Idaho.

2) The booklet on foreign animal disease, a "one-of-its-kind" booklet, should be revised and updated.

3) The Executive Committee must be given more time to review, analyze, and

adopt recommendations of the various committees.

4) A committee should be created to deal with problems relating to radioactive fallout.

Anaplasmosis Immunization Studies

K. L. Kuttler, Reno, Nevada

Vaccination of anaplasmosis-susceptible calves and cows increased resistance to anaplasmosis, judging by clinical effects, but has not prevented the disease. Vaccinated animals had significantly higher packed cell volumes, longer incubation periods, and higher complement-fixation (CF) titers after challenge than did unvaccinated controls; CF titers in vaccinated animals ranged from 1:5 to 1:60. Most CF titers due to vaccination did not persist longer than 101 days.

Vaccine was prepared from blood containing 40 to 60% *Anaplasma*-infected RBC. Carbon dioxide was added as an adjuvant and mineral oil as a base. Four splenectomized calves were vaccinated and 3 splenectomized calves served as controls. Whole blood from an anaplasmosis-carrier animal was injected subcutaneously to determine degree of protection induced by the vaccine. Trials with 50 yearling calves and 50 controls and with mature cows were also conducted.

Report of Anaplasmosis Committee

M. N. Riemenschneider, Oklahoma City, Oklahoma

Anaplasmosis costs livestock men an estimated \$50 million annually, and it occurs in 40 states. Consequently, anaplasmosis control has been given serious consideration. An anaplasmosis complement-fixation (ACF) diagnostic antigen has been developed. Over 4 million test doses have been produced. The antigen is available

free for research studies, cooperative control programs, and field trials. Presently, there are 15 laboratories that have personnel trained to perform the ACF test. Thirty serologists have been trained and another 12 to 15 will receive training next year.

With ACF testing combined with segregation practices and periodic spraying, seven

Texas herds have been able to prevent occurrence of new reactors for as long as two years. Previously, anaplasmosis had been a serious problem in all herds.

In Hawaii, where no anaplasmosis in native cattle was reported in fiscal 1960-1961, a number of imported cattle were found to be infected by application of the ACF test. Such cattle were sent immediately to slaughter or held for further testing. It was found that vaccination with *Leptospira pomona* bacterin interfered with the ACF test, especially in leptospirosis-infected herds.

Because many aspects of anaplasmosis are not well understood, further research is necessary. Vectors, such as ticks, have been incriminated, but their role in relation to anaplasmosis has not been conclusively determined. The nature of the causative agent is not clear and, until more is known about it, development of immunizing agents, treatments, and control measures will be hindered seriously. The ACF test needs further development to improve specificity and simplicity. It has been recommended, therefore, that anaplasmosis research be expanded generally.

Problems Encountered in the Interstate Movement of Feeder Pigs

Keith Meyers, Grundy Center, Iowa

The biggest problems we encounter in interstate movement of feeder pigs involve people. Some producers have little concern over what happens to pigs once they leave the premises. However, these producers are diminishing in number, and producers anxious to protect their reputations are replacing them. Producers who deliver inferior or diseased pigs won't stay in business long. Placing a name and an ear tag with a number that permits identification of the producer has been good for the swine industry.

Dealers can ruin good lots of pigs if they fail to clean and disinfect premises and trucks. Avoidance of overcrowding and too

long a stay in trucks is a dealer responsibility.

Regulatory officials have a responsibility to develop uniform rules and regulations. At present some states require permits. Some will wire permits; others will send them by mail only. Some states require the name of the local veterinarian; some location of the farm; some ear tags; some, vaccination prior to shipment; and some prohibit vaccination prior to shipment. Where forms are required, there is no similarity. Far too often, laws and regulations are written for an economic advantage rather than for the concern of the health of the pigs. First consideration should be given to the health of the animals.

Investigations of "Serum Block" in Swine

H. W. Dunne, University Park, Pennsylvania

The only workable method of alleviating the effects of "serum block" lies in prevention. Elimination of the practice of using serum alone at community sales is the only logical method of curbing the problem.

The main difference between virulent virus vaccine and modified live-virus vaccine, as far as immunogenic ability is concerned, lies in the relative quantities of virus particles. Use of diluent in production of modified live-virus vaccines, freeze drying, and subsequent handling of the product up to the time it is administered

may seriously reduce its immunizing ability. The solution to some problems associated with present vaccinating methods, such as serum block, seems to lie in development of modified live-virus vaccines with higher titers—more virus particles. Methods of titering vaccines may also need improvement.

Attenuated vaccines have proved themselves in many ways and will continue to serve a useful purpose, but guidelines must be established to assure maximum efficiency in their usage.

Report of Committee on Nationwide Eradication of Hog Cholera

C. L. Campbell, Tallahassee, Florida

There are now 40 states that prohibit use of virulent hog cholera virus, eight more than last year.

Information developed in connection with the Suwannee County, Florida, pilot test program indicates that, in the past nine months, shortening of the expiration periods of modified live-virus vaccines used increased immunity in pigs from 57.5% to 76.5%. No new cases of hog cholera have been reported in this county in the last year since these expiration periods were shortened.

The following specific methods of vaccination are recommended for swine destined for interstate movement and not for immediate slaughter:

1) Modified live-virus vaccine and at least 20 cc. of anti-hog cholera serum should be given at least 21 days prior to shipment. Hogs may be shipped so as to arrive at destination within 72 hours after vaccination, provided they are quarantined at destination for at least 21 days.

2) Modified live-virus vaccine if used alone must be given not less than 21 days prior to shipment.

3) Inactivated vaccine should be given not less than 21 days prior to shipment or more than ten months prior to shipment.

Hog cholera-free areas, if established, should include no area smaller than a state. Some requirements for maintaining hog cholera-free areas are:

1) Hog cholera must be a "reportable" disease.

2) Vaccination should be restricted to use of inactivated vaccine.

3) Authority to quarantine must be established for regulatory officials.

4) Uncooked garbage must not be fed to swine.

5) Importation of swine for purposes other than immediate slaughter must be under close supervision.

Committee of the National Eradication of Hog Cholera at Meeting To Help Implement Recently Authorized Hog Cholera Eradication Program



Left to right—Drs. J. D. Ray, Whitehall, Ill.; S. H. McNutt, Madison, Wis.; F. E. Ziegenbein, Lincoln, Neb.; A. L. Sundborg, Des Moines, Iowa; J. P. Torrey, Ames, Iowa; C. L. Campbell, Tallahassee, Fla., chairman; H. W. Dunne, University Park, Pa.; and G. H. Wise, Washington, D.C.

Swine Brucellosis as a Public Health Problem

S. L. Hendricks, Des Moines, Iowa

Despite the apparently low brucellosis infection rate among swine herds and individual swine, a significant public health hazard exists. Swine raisers, their families, and swine handlers are exposed to infected animals. In a large packing house, a single infectious hog passing through the processing line may expose dozens or even hundreds of employees. Even with only 1% of the hogs infected, as many as 50 or more infected hogs may be slaughtered during a single day in one of the larger packing houses. Thus, it is likely that each employee on the killing floor and in some other departments would be repeatedly and in-

timately exposed by direct contact to fresh, warm, infectious tissues during each day of normal operations. Other employees may be subjected to indirect exposure through contaminated environment.

Cases of human brucellosis originating from cattle decreased from 58% in 1957 to 15% in 1960; during the same period, cases originating from swine increased from 15% to 49%. The geographic distribution of human brucellosis in 1960 correlates well with the concentrations of swine. Consequently, swine brucellosis is most prevalent in Iowa and adjacent states.

Report of Committee on Brucellosis

R. W. Smith, Concord, New Hampshire

A resolution was introduced to approve back-tagging and market-testing procedures when 5% of all female cattle 30 months of age and over in all herds in a control area have been screened annually for three years. Other herds shall be tested in compliance with uniform methods and rules, provided the level of infection is below minimum official levels and an official vaccination program (% of vaccinated heifer calves retained or added annually to be determined by local area option) is in effect. Such procedures shall be acceptable for official initial certification.

The percentage of replacement heifer calves to be vaccinated to comply with the section may be varied by local conditions and agreed upon by federal and state regulatory officials and the owners of affected cattle in the area.

It was recommended that state and federal funds be allocated to assure completion of the program as quickly as possible. It was also recommended that all states adopt the word "validated" in lieu of "certified" for designating brucellosis-free swine herds.

Four methods (abridged here) of herd qualification for a modified certified brucellosis area were proposed:

1) Brucellosis milk ring tests. These shall be conducted on dairy herds in an area

over a three-year period, with follow up blood tests of suspicious herds.

2) Blood tests of breeding cattle over 3 years of age which are parturient or post-parturient and which are consigned to market or sale for any purpose.

3) Blood test of a representative sample group of breeding cows over 3 years of age in each herd. The sample must contain enough animals to provide a 95% probability of finding brucellosis, if present, at the 2% level of disease incidence among the animals tested.

4) A complete herd blood test 18 months prior to the data area certification is requested.

Eradication of swine brucellosis will depend on:

1) Movement of only brucellosis-free swine for breeding purposes.

2) Identification of slaughter boars, stags, and sows so that herds of origin can be determined when reactors are found.

3) Application of uniform plans in regard to validation of swine herds as brucellosis-free, and eradication of infected herds. Two plans for eradicating infected herds are proposed, one for dealing with commercial herds and one for dealing with purebred herds. An alternative plan was also proposed for application to herds where only a few reactors are found and no clinical signs are present.

Report of Committee on Federal Programs and Policies

W. L. Bendix, Richmond, Virginia

An additional \$1 million was provided the Animal Disease Eradication Division (ADE) for fiscal 1962 for tuberculosis eradication. An additional \$2 million allocation has been recommended for 1963, these funds to be used for studying causes of response to the tuberculin test other than tuberculosis; to establish relationship among bovine, avian, and human tuberculosis organisms and paratuberculosis organisms and their effect on the eradication effort; and to develop more effective case finding through slaughterhouse trace-backs.

About 25% of tuberculosis reactors are now found through trace-backs and this method is about 85% accurate. Funds would also be used to permit an increase in the annual testing from 2 to 3 million head.

The matter of brucellosis vaccination of calves is causing concern. In fiscal 1960, there were 6.4 million calves vaccinated—300,000 less than the previous year. The minimum acceptable vaccination rate that will permit us to maintain the gains already made and reach the goals we seek is 8 to 10 million calves annually. Such a vac-

cination rate would provide approximately a 60% coverage, a minimum amount. The slump in calf vaccination starts in the certified states, when county testing is complete, the state certified, and the problem dismissed from the minds of many.

Scabies in sheep or cattle exists in 1,700 counties. It is estimated that \$6,000 to \$8,000 per county would achieve total eradication which would amount to \$11 million over a five-year period.

The cost of eradicating hog cholera, once a serious program is in effect, is estimated at \$4 million the first year and \$8 million to \$10 million annually thereafter for eight years.

There is a need for more authority, personnel, and facilities to handle inspection and quarantine at all air, ocean, and land points of entry into the United States. A minimum of 67 additional persons, six new facilities along the Canadian border, modernization of the Clifton, N.J., quarantine station, and construction of new quarantine stations in Florida and on the West Coast are necessary.

A thorough study of epornitic (poultry) diseases has been recommended. To do this,



Cocktail hour and buffet supper sponsored by National Brand and Tag Company of Kentucky highlighted Thursday evening's social activities.



AVMA Representatives Attend U.S.I.S.A. Meeting in Minneapolis

Left to right—Drs. J. R. Hay, AVMA Director of Professional Relations; Arthur Freeman, AVMA Assistant Editor; A. E. Janawicz, Montpelier, Vt., meeting participant; Mark L. Morris, AVMA president; R. J. Schroeder of Downey, Calif., AVMA Executive Board member from District X. Not shown: Dr. D. D. Spangler, Atwater, Minn., AVMA Executive Board member from District VI.

the ADE Division needs to add 5 specialists to its staff at a cost of \$15,000 each for a total of \$75,000 for the first year.

The animal disease center at Beltsville needs to be converted to a parasite research

facility as soon as possible. This will cost approximately \$3 million plus an operating budget of 650,000 annually. Such costs are small when compared with annual livestock losses due to parasites.

Committee on Laws and Regulations

J. W. Safford, Helena, Montana

Total variations of import regulations in the United States number 125. Most are in the Northeast and the fewest in the Southwest. Great lack of uniformity of livestock health import requirements is found in connection with hog cholera, brucellosis in cattle, and rabies. These three account for 99 of the 125 variations. There are 28 variations in brucellosis import requirements in the United States, 9 variations in tuberculosis requirements, 49 variations in hog cholera requirements,

and 20 variations in rabies import regulations.

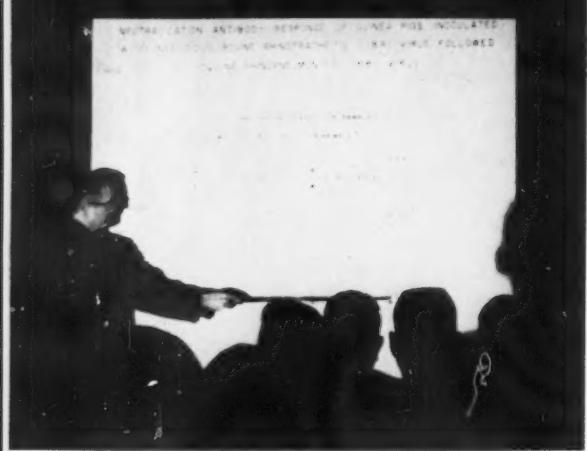
Since a nationwide hog cholera eradication program has been established, it is considered imperative that the requirement variables pertaining to this disease be eliminated. It is proposed that a model swine import regulation be developed that can be recommended for adoption by all states; that a standardized rabies vaccination procedure be developed; and that brucellosis-import regulations be standardized.

Standardization of Quantitative Serologic Tests

D. S. Robson, Ithaca, New York

The continuing development of quantitative serologic tests and their increasing importance as a tool in veterinary research and the commercial production of veteri-

nary products necessitates further standardization of these techniques to ensure an acceptable level of reliability. All existing serum-neutralization tests must differ in-



Three-day meeting was characterized by 32 authoritative scientific reports and 22 committee reports.

herently in reliability due to natural differences in the cytopathic effect of the agents involved. Standardization to a common level of accuracy, therefore requires differential modifications of individual tests.

According to our test results, threefold serum dilutions should be used in neutralization tests in eggs for distemper and in tissue culture for infectious canine hepatitis, in order to eliminate bias in the calculated 50% end point. A two-stage procedure using first tenfold and then threefold dilutions could be followed, however, to attain the desired precision with less effort. The 50% end point may first be determined approximately by a series of

tenfold dilutions with five eggs or five tissue culture tubes per dilution, and then determined more accurately from a series of five, threefold dilutions centered near the approximate 50% end point and, again, using five eggs or five tissue culture tubes per dilution.

Theoretically, this two-stage procedure should result in no more than a twofold error in the final 50% end point. Technical errors do occur, however, and, as a safeguard in such critical tests as the evaluation of a commercial antiserum, the second stage of the procedure should be supplemented with a parallel test run on a reference serum of known titer.

Status of State-Federal Cooperative Tuberculosis Eradication

A. F. Ranney, Washington, D.C.

As a result of area testing, many infected herds are detected in the early stages of disease. Early detection often cannot be accomplished by tracing the origin of cattle with tuberculosis lesions at slaughter. Early detection makes it possible to halt widespread infection in the herd.

Area testing is the only means of locating infected cattle in a relatively large number of herds. That there is value to be derived from expanding the amount of area testing can be shown by the fact that 66% of all herds in which new gross lesions were found during the period from Jan. 1, 1959, to April 30, 1961, were found as a result of area tests. There were 898 such herds.

During the past year, progress has been made in dealing with "red flag" herds.

These are herds, presently under quarantine, from which reactors with gross lesions have been found on repeated tests. Some of these herds have been infected for many years. The number of these herds in the nation has been reduced from 239 in July, 1960, to 101 in July, 1961. This 58% reduction supports the contention frequently made that we do have the tools and know-how to eradicate tuberculosis.

Examination of a comparative record of slaughtered tuberculosis reactors shows that, in fiscal 1961, 273 bovine carcasses were condemned and 43 passed for cooking. This is a 60% increase for cattle in these categories in two years. It is likely that a large part of this increase is the result of concentrated eradication efforts in "red flag" herds.

Report of Committee on Tuberculosis

R. W. Carter, Columbia, South Carolina

To strengthen the tuberculosis eradication program, it was urged that all states adopt the following program priorities:

1) Concentrate on elimination of "red flag" herds and others known to harbor tuberculosis.

2) Thoroughly examine for tuberculosis all life on premises where the disease is found. Cooperate with public health officials in determining health status of persons associated with the infected herds.

3) Develop procedures for identifying market slaughter cattle so that those found to be tuberculous at slaughter may be used to identify the herd of origin.

4) Determine origin of all reactors and test appropriate herds of origin; give special consideration to reactors with advanced tuberculosis.

5) Test animals and herds exposed to tuberculosis.

6) Maintain modified accreditation status as a means of locating early herd infection.

7) Develop procedures for identifying all market slaughter swine and chickens so that those that are tuberculous at slaughter may be readily identified with the premises of origin and steps can be taken to eliminate the disease from the premises.

By statistical analysis, it has been found that there is a correlation between cattle densities, type of cattle operation, and incidence of tuberculosis, both actual and predictable. As a result, further analysis based on statistical information from several states is now in progress.

Report of Public Health Committee

R. J. Schroeder, Downey, California

It was suggested that research groups working in the field of human behavior be approached to learn how to develop programs that will be favorably received by the public. There seems to be a need to know if disease-control programs are being offered in a desirable form so that a spirit of cooperation and not of resentment is engendered.

It was recommended that the U.S.L.S.A. should serve as the "catalyst" group to spark and guide the energies of the many and diversified groups that are seriously interested in controlling mastitis. A mastitis committee of national stature was proposed.

The most common vehicle of transmission of trichinosis is considered to be pork sausage. In an Ohio study of 34 cases of

trichinosis, raw, smoked, and insufficiently cooked pork sausage was involved in 21 cases, insufficiently cooked hamburger in 7, and inadequately prepared ham in 4. There seems to be a need for more rigid enforcement of garbage-cooking regulations to further minimize possibility of infection with trichinosis.

It was suggested that the term "equine encephalomyelitis" is not accurately descriptive of the disease it represents and that the terms "eastern encephalitis" and "western encephalitis" be used instead.

Because *Listeria monocytogenes* is becoming recognized more and more as a disease of man, practicing veterinarians should report diagnosed cases to public health agencies and should advise clients of the human disease potential.

A Six-Month Survey of Staphylococcal Flora in the Milk from a Large Dairy Herd

M. M. Galton, Atlanta, Georgia

Composite milk samples obtained from one to six times at monthly intervals from a herd of 262 dairy cows, including re-

placements, were examined for the presence of coagulase-positive staphylococci (CPS), a known causative agent of bovine masti-

tis. A total of 1,010 milk samples were examined and CPS were isolated from 713 (71%). Difference in antibiotic-sensitivity pattern revealed the presence of more than one strain of CPS in 85 (8%) of the samples.

All CPS isolated were tested for sensitivity to five antibiotics. They were most resistant to both penicillin and dihydrostreptomycin, and most sensitive to oxytetracycline, chloramphenicol, and erythromycin.

Phage typing was performed on all CPS isolated. A total of 801 strains were tested and 551 (68%) were typeable. Phage type 80/81 was recovered from 40 cows (15%) and phage type 77/44A from 126 (48%). Type 42D was not found alone and only rarely was it detected in combination with other phages.

The occurrence of clinical mastitis could not be attributed to the presence of any particular staphylococcal phage pattern.

Report of Committee on Biologics and Pharmaceuticals

N. H. Casselberry, Berkeley, California

Last year in Florida it was found that certain modified live-virus hog cholera vaccines did not induce adequate protection in some pigs for the normal feeding period. Most failure involved aged vaccine of one type, even though it was used before the labeled expiration date. As a result, testing procedures of vaccine prior to release for market were made more rigid. Substantial surpluses of virus were required, when vaccine was produced, to compensate for possible losses due to shipment and storage. Manufacturers must now perform tests on vaccines at expiration date; 1/10 of the recommended field dose at this time must immunize pigs.

For potency testing, it was decided that a small fraction of a field dose of freshly prepared dried vaccine should be used. If this small dose was immunogenic, then an adequate surplus could be considered present. The fractional dose would vary with different manufacturers depending on stability information developed by each man-

ufacturer. It was reported that this critical testing would assure adequate potency.

To qualify pigs for movement through community sales or interstate, administration of anti-hog cholera serum and modified live-virus vaccine was recommended. Use of serum alone on such occasions was considered of questionable value. If used, however, a warning certificate should accompany the pigs so that the purchaser would know protection was only temporary. For durable protection, modified live-virus vaccine should be given at least two weeks after serum injection.

* * *

Infectious bovine rhinotracheitis vaccine should not be used to vaccinate pregnant cattle. Although proof is not conclusive, there is evidence indicating that the vaccine may be responsible for causing abortion.

Report of Representative to the Annual Meeting of the National Association of State Departments of Agriculture

W. L. Béndix, Richmond, Virginia

The Secretary of Agriculture was commended for his proposal to reinstate the standards for federally inspected hams that were in effect prior to Dec. 30, 1960,

affecting the amount of water that may be added. Moisture should not be added to hams in excess of the original "green" weight.

It was suggested that inspection of animals being transported from screwworm-infested areas of the Southwest and Southeast be made more effective, and that a program be inaugurated for complete eradication of screwworms.

The N.A.S.D.A. favored appropriation of funds for face fly eradication, for hog cholera eradication, for scabies eradication, for remodeling the Beltsville parasite research laboratory (\$500,000), and for an intensified program for eradication of swine brucellosis.

Report of Committee on Stockyards, Markets, and Transportation

J. J. Martin, Washington, D.C.

Facilities for livestock at ports of entry along the Canadian border should include shelter from inclement weather, inspection chutes, satisfactory pens, and cleaning and disinfection equipment. If facilities cannot be furnished by private ownership, government funds should be allocated.

Repair of Hernia in Horses

Repair of umbilical hernia in young horses is accomplished easily and quickly by means of metal skewers placed at right angles to one another through the hernial sac. An iodine-soaked ligature is then interspaced between the skewers and the body wall. The hernial sac will swell and detach in approximately 12 days, leaving a clean, flat granulating surface that heals quickly and smoothly, leaving no blemish. This is much simpler than using clamps for those small umbilical openings that admit only one finger. The larger (2 or more fingers) umbilical openings are obliterated by open reduction. Heavy Vetafil (1.1 mm.) horizontal mattress sutures are inserted so as to pass through the abdominal wall and the peritoneal portion of the hernial sac. All sutures are placed prior to tying. When all are in place, the hernial ring is closed by drawing all sutures snug at one time. The central one is secured first; then the others are placed, alternately anterior and posterior to the central suture. The excess peritoneal sac is removed, and the subcutaneous fascia drawn over the abdominal closure with No. 2 chromic catgut. The skin sac is closed with medium weight Vetafil horizontal mattress sutures and excess skin carefully removed.

In all cases, our Vetafil sutures are steam-sterilized prior to use. Reports have been made of Vetafil sutures being sloughed out of the horse in a few weeks after surgery. This could come from nonsterile technique or possibly from irritation caused by chemical disinfection of the suture material prior to surgery. We have successfully buried Vetafil sutures in equine surgery for some three years without repercussion. In all cases, steam sterilization has preceded surgery.—*William F. Riley, Jr., D.V.M., M.S., Michigan State University, at 1961 Illinois Veterinary Conference and Short Course, Urbana, Ill.*

Systemic Treatment of *Vibrio fetus*-Infected Bulls

R. B. Lank, D.V.M., M.S.; C. L. Seger, D.V.M., M.S.; Helen E. Levy, B.S.

VIBRIOSIS is a venereal disease of cattle causing significant economic losses in infected herds. The disease manifests itself as temporary infertility in the cow. The bull acts as an asymptomatic carrier of the disease for long periods. In the bull, the causative organism, *Vibrio fetus* is present on the penile and preputial mucosa and is frequently in the semen from infected individuals.

The addition of streptomycin and penicillin to extended fresh semen from infected bulls renders it relatively safe for use in artificial insemination.^{9,11} Procedures employed in freezing semen do not result in destruction of the *V. fetus* organism, so additional efforts must be made to establish the *V. fetus*-free status of the bull whose semen is to be frozen.^{7,8} The disease is readily transmitted to the cow by the infected bull at the time of coitus, so it is obvious that a *V. fetus*-free bull is necessary to the over-all breeding efficiency of a range herd operation.

Various treatments have been recommended for the infected bull. In general, the successful ones have been those in which an antibiotic has been applied locally to the penis and prepuce daily for up to four days.^{1,3-6,10}

Under usual farm conditions, applying local therapy to the penis and prepuce of a bull is frequently difficult. However, systemic therapy, is more easily applied and, if effective, should be more widely accepted. In unreported trials,* tetracycline used systemically and as a douche was not highly effective in eliminating *V. fetus* infection from bulls.

From the Department of Veterinary Science, Louisiana State University, Baton Rouge.

This work is an integral part of regional project S-30, Infectious Diseases Affecting Reproduction in Cattle and Sheep.

*Lank, R. B., Louisiana State University, Baton Rouge: Unpublished data, 1957.

This report describes results of systemic dihydrostreptomycin therapy of *V. fetus*-infected bulls.

Materials and Methods

Vibrio fetus infection was diagnosed in bulls by the culture of semen according to previously reported procedures.² Catalase positive *V. fetus* organisms were isolated from two semen samples from each bull before treatment was begun. Semen samples were cultured for *V. fetus* organisms at frequent intervals after treatment to determine effectiveness of therapy. As a further determination of effectiveness of therapy, *V. fetus*-negative, virgin heifers were inseminated with semen and preputial washings from bulls which approximately one year earlier had been treated systemically for *V. fetus* infection with dihydrostreptomycin. Cervical mucus from *V. fetus*-infected cows was cultured at the same time test cows were examined to determine the efficiency of the cultural methods. After 30 days had elapsed, test cows remaining *V. fetus*-negative were infected by infusing a 72-hour culture of *V. fetus* organisms grown in Albimi broth into the cervical canal to prove their susceptibility to the infection.

Nine *V. fetus*-positive bulls were treated intramuscularly with dihydrostreptomycin sulfate, 7 mg./lb. of body weight, twice daily for four days.

Nine *V. fetus*-positive bulls were treated intramuscularly with dihydrostreptomycin sulfate, 15 mg./lb. of body weight, twice daily for four days.

Results

Vibrio fetus was isolated from 4 of the 9 bulls treated with dihydrostreptomycin, 7 mg./lb. of body weight, twice daily for four days in from two weeks to six months after treatment (Table 1). *Vibrio fetus* was not isolated from the semen of 5 bulls. Bull BXI left the stud 72 weeks post-treatment, during which time 47 semen samples were examined, and all were negative for *V. fetus*. Bull GXI was removed from the stud 55 weeks post-treatment, during which time 39 semen samples were

TABLE 1—Intramuscular Dihydrostreptomycin Therapy of *Vibrio fetus*-Infected Bulls at a Dosage of 7 mg./lb. of Body Weight Twice Daily for Four Days

Bull	Treatment started	V. fetus-negative*			V. fetus-positive*			Remarks
		Date	Semen samples	Weeks	Date	Weeks after treatment		
GX3	12-16-57	12-18-57 to 3-31-58	17	15	4-14-58	17	.....
JX1	12-16-57	12-23-57 to 12-30-57	2	2	1-6-58	3	.....
JX2	12-16-57	12-18-57 to 6-6-58	24	24	6-13-58	25	.....
JX5	12-16-57	12-23-57 to 4-7-58	16	16	4-14-58	17	.....
BX1	12-16-57	12-18-57 to 4-16-59	47	72	None	....	Departed stud 4-16-59 after 47 negative semen samples.	
GX1	12-15-57	12-18-57 to 1-7-59	39	55	None	....	Departed stud 1-7-59 after 39 negative semen samples.	
HX1	12-16-57	12-18-57 to 4-11-60	63	121	None	....	Test insemination V. fetus negative on 4-11-60.	
HX2	12-16-57	12-18-57 to 3-10-60	64	115	None	....	Test insemination V. fetus negative on 3-10-60.	
HX4	4-22-58	5-2-58 to 1-4-60	39	88	None	....	Test insemination V. fetus negative on 1-4-60.	

*Based on semen cultured post-treatment.

examined, and all were negative. An additional analysis of the effectiveness of therapy was made on bulls HX4, HX2, and HX1 by infusing semen and preputial washings into *V. fetus*-negative, virgin heifers. This test was performed at a variable number of weeks post-treatment as follows: HX4, 88 weeks; HX2, 116 weeks; and HX1, 121 weeks. None of the virgin heifers developed *V. fetus* infection.

Vibrio fetus was not isolated from the semen from any of 9 infected bulls after treatment with dihydrostreptomycin, 15 mg./lb. of body weight, twice daily for four days (Table 2). Eight of the 9 were further examined by test inseminations

sing *V. fetus*-negative, virgin heifers. *Vibrio fetus* was recovered from the cervical mucus of the heifer which served as test animal for bull GX3. Bull JX6 was removed from the stud nine weeks after treatment, during which time four semen samples were examined with negative results. Previously, 3 of these bulls, JX2, JX5, and GX3, had been unsuccessfully treated with dihydrostreptomycin at a dosage of 7 mg./lb. of body weight, twice daily for four days.

Discussion

Dihydrostreptomycin sulfate at a dosage of 7 mg./lb. of body weight twice daily

TABLE 2—Intramuscular Dihydrostreptomycin Therapy of *Vibrio fetus*-Infected Bulls Given a Dosage of 15 mg./lb. of Body Weight Twice Daily for Four Days

Bull	Treatment started	V. fetus-negative*			Remarks
		Date	Semen samples	Weeks	
GX2	4-7-59	4-10-59 to 2-8-60	12	43	Test insemination V. fetus negative on 2-8-60.
HX3	4-7-59	4-13-59 to 2-8-60	14	43	Test insemination V. fetus negative on 3-10-60.
JX2**	4-7-59	4-17-59 to 3-10-60	20	48	Test insemination V. fetus negative on 3-10-60.
JX3	4-7-59	4-8-59 to 4-11-60	16	52	Test insemination V. fetus negative on 4-11-60.
JX4	4-7-59	4-15-59 to 3-10-60	10	43	Test insemination V. fetus negative on 3-10-60.
JX5**	4-7-59	4-15-59 to 2-8-60	10	43	Test insemination V. fetus negative on 2-8-60.
JX6	4-7-59	4-15-59 to 6-10-59	4	9	Departed stud 6-11-59 after 4 V. fetus negative semen samples.
JX7	5-11-59	6-8-59 to 4-11-60	12	48	Test insemination V. fetus negative on 4-11-60.
GX3**	4-7-59	4-13-59 to 4-11-60	38	52	<i>Vibrio fetus</i> from heifer test inseminated 4-11-60.

*Based on semen cultured post-treatment. **Unsuccessfully treated with dihydrostreptomycin at 7 mg./lb. of body weight.

for four days apparently effected recovery from *V. fetus* infection in 5 of 9 bulls treated. Three of the 5 successfully treated were negative for *V. fetus* when semen and preputial washings were inseminated into *V. fetus*-negative cows from 88 weeks to 121 weeks post-treatment. The 2 other successfully treated bulls were negative on all post-treatment semen cultures until they were removed from the stud. A total of 39 different semen samples were cultured from 1 bull, and 47 samples were cultured from the other bull post-treatment. This number of negative samples was considered sufficient to classify the bulls as successfully treated.

Dihydrostreptomycin sulfate at a dosage of 15 mg./lb. of body weight eliminated the infection from 7 of 8 bulls. The ninth, JX6, was removed from the stud nine weeks post-treatment. Although *V. fetus* organisms were not recovered from his semen after treatment, it was felt that too few samples were taken and too short a period had elapsed to accurately evaluate the effectiveness of the therapy. *Vibrio fetus* organisms were not recovered from the semen of any of the other 8 bulls treated with dihydrostreptomycin at the 15-mg. level. However, on test insemination of *V. fetus*-negative virgin heifers with semen and preputial washings from each bull, organisms were recovered from the cervical mucus of the heifer which served as a test animal for bull GX3. The semen from GX3 contained a spreading organism, and it is possible that *V. fetus* had been present, although unrecognized, for sometime. It is also possible that this bull was actually treated successfully and later became reinfected since 1 cow, used as a dummy for collection purposes, was found infected a few weeks before the test inseminations were made.

There was no visible difference between *in vitro* studies of the susceptibility of *V. fetus* organisms recovered from bulls before treatment and that of the organisms recovered from bulls after being unsuccessfully treated with dihydrostreptomycin. Unfavorable results were not observed in the bulls treated with dihydrostreptomycin at either dosage level, with the exception of transient, slight incoordination evident on the fourth day of treatment with dihydrostreptomycin at the level of 15 mg./lb. of body weight. The semen was unaffected.

Research now in progress indicates a smaller dosage of dihydrostreptomycin over a longer period may be as effective in treatment of infected bulls as the 15 mg./lb. level reported here. Obviously, such a finding would reduce considerably the cost of effective therapy.

Summary

Dihydrostreptomycin sulfate given intramuscularly at a dosage of 7 mg./lb. of body weight twice daily for four days was successful in eliminating *Vibrio fetus* infection from 5 of 9 bulls. Dihydrostreptomycin sulfate given intramuscularly at a dosage of 15 mg./lb. of body weight twice daily for four days was successful in eliminating the infection from 7 of 8 bulls.

Significant adverse effects were not observed in any of the bulls or their semen. The susceptibility to dihydrostreptomycin sulfate of the *V. fetus* organisms recovered from unsuccessfully treated bulls was not affected.

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The Button Technique for Correction of Prolapse of the Vagina in Cattle

Arnold F. Hentschl, D.V.M.

A MODIFICATION of Minchev's technique to permanently correct chronic prolapse of the vagina and cervix in the cow was demonstrated in 1958.¹ We have used this procedure in practice and found it remarkably successful. However, when ordinary heavy four-hole overcoat buttons were used instead of gauze rolls as the anchoring devices, results were improved.

Procedure

Epidural anesthesia is used and in fractious animals a tranquilizer. Both gluteal regions are surgically prepared. About 12 inches of extra heavy synthetic suture* or umbilical tape (1/8 inch) is threaded through all four holes of a button so that there are two strands of equal length. Both are attached to a 5½-inch straight hernia needle. After locating the posterior aspect of the ilium by vaginal palpation, the needle is introduced into the vagina and thrust outward dorsolaterally through the vaginal wall so that it will penetrate the skin about 1½ inches lateral to the spinal column, posterior to the shaft of the ilium (Fig. 1). If the intravaginal button is held in the palm of the hand it can be used as a bearing surface when forcing the needle through the muscle and skin. The needle is removed and the sutures are threaded

through all four holes of a second button.^{**} Sutures are drawn taut and tied holding the vagina dorsally and anteriorly to its normal position. The intent is to bring the retroperitoneal surface of the vagina and the peritoneum of the pelvic cavity in apposition so that adhesions form and recurrence of the prolapse is prevented. The procedure is performed on both sides.

Care is necessary to avoid damaging blood vessels or rectum. With caution and careful intravaginal palpation, this can be done. We have never encountered a problem in this regard.

After-care consists of the daily application of a methyl violet compound to the top button. Umbilical tape suture acts as a wick, and the medication permeates the full length of the suture. Buttons and suture are removed in 10 to 14 days.

Discussion

This method of surgical repair has been used successfully in cows with vaginal prolapse just prior to calving. In some instances the buttons were in place during calving and in some the buttons had been removed. In most cases the adhesions prevented the prolapse from recurring postparturiently. On occasion, when the adhesions were destroyed during calving, the procedure had to be repeated, but adverse effects on the cow or on the desired results did not occur.

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Presented before the Section on Large Animals, 98th Annual Meeting of the American Veterinary Medical Association, Detroit, Mich., Aug. 20-24, 1961.

¹Carlson, V. A., and Thibeault, C.: Belgian Modification of Minchev's Operation for Prolapse of the Vagina in the Cow.

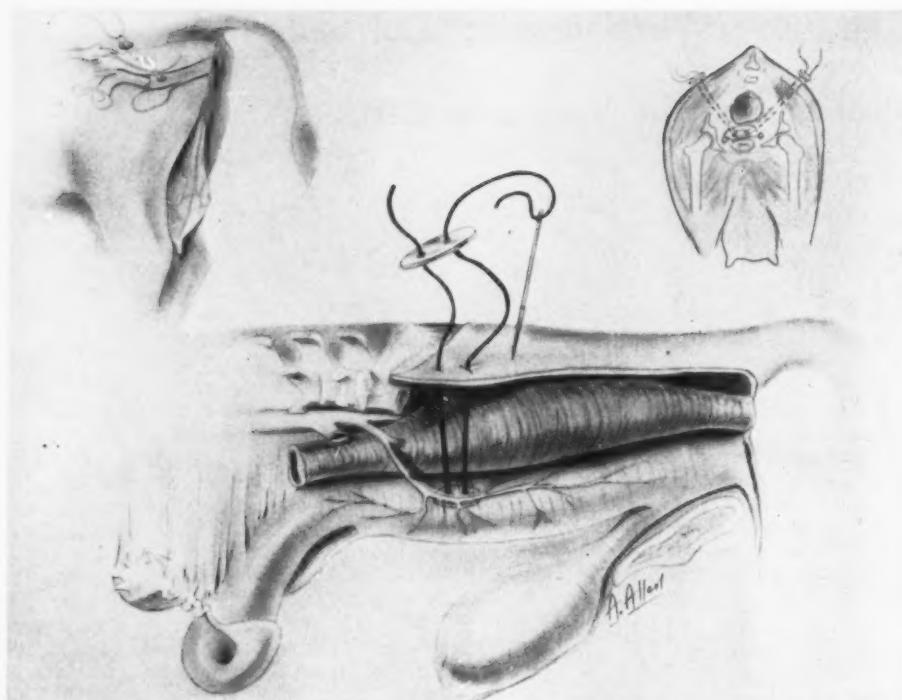
*Vetafil, Bengen and Co., Hanover, Germany.

**Buttons with two holes are shown in the diagram.

Summary

A modification of Minchev's technique for correcting prolapse of the vagina and

**Buttons with two holes are shown in the diagram.



—Drawing by A. R. Allen, Purdue University

Fig. 1—Correction of vaginal prolapse using a modification of the Minchev technique in which overcoat buttons instead of gauze rolls are employed.

cervix in cattle employs two heavy four-hole overcoat buttons, held together by sutures. One button is placed in the vagina and the other on the dorsal aspect of the gluteal region. These hold the vagina dor-

sally and anteriorly in apposition to the tissues of the pelvic cavity. In most cases, resulting adhesions prevent the prolapse from recurring after the suture and buttons are removed.

Abomasal Displacement Diagnosed More Frequently

Prior to the last decade abomasal displacement in the dairy cow was seldom diagnosed. Three reasons have been suggested: (1) Because of similarity of clinical signs, many cases of abomasal displacement were probably misdiagnosed as ketosis; there is usually a history of recent parturition and presence of ketones in milk in both conditions. (2) Abomasal displacement is not likely to be detected on necropsy unless a special effort is made to find it; significant lesions usually are not present. (3) Veterinarians were relatively unaware of the abnormality because abdominal surgery was not often performed, and published reports were few.—*Vet. Rec.*, 73, (July 29, 1961): 729.

Fascioliasis in a Mexican Burro

D. R. Collins, D.V.M.

IN THE PAST several years, a large number of Mexican burros (*Equus asinus*) have been imported into this country to be sold as children's pets or to be used as research animals. In the literature available to the author,^{2,3,5,7,12} fascioliasis has not been reported in the equine species from continental North America. *Fascioloides magna* has been reported in horses in Hawaii.⁵ A number of foreign reports describe *Fasciola hepatica* parasitism in equine animals.^{4,6,8,9} This report describes a case of *F. hepatica* parasitism in an immature, male Mexican burro imported into this country.

History

This burro was one of a band of 30 experimental animals housed at the U.S. Army Medical Unit, Fort Detrick, Md. The band was procured from an importer from whom the following information on their origin and history prior to arrival at Fort Detrick was obtained.

The band was made up of animals originating in the Mexican states of Tamaulipas and Nuevo Leon. As the population near the United States-Mexican border has been markedly decreased, it is probable that the greater portion originated from the southern half of Nuevo Leon and the western and southern parts of Tamaulipas. Following central collection at Matamoros, the herd was imported at Brownsville, Texas, in early August, 1959. They arrived on the importer's premises at Hanover, Ill., in mid-August, 1959, and remained there until shipped to Fort Detrick on Sept. 1, 1959. In November, 1959, approximately two and one half months following importation, parasitism was discovered in the burros.

During their residence at Fort Detrick, all animals appeared to have rough coats, were in poor flesh and, although they ate until their abdomens were grossly distended, they remained unthrifty.

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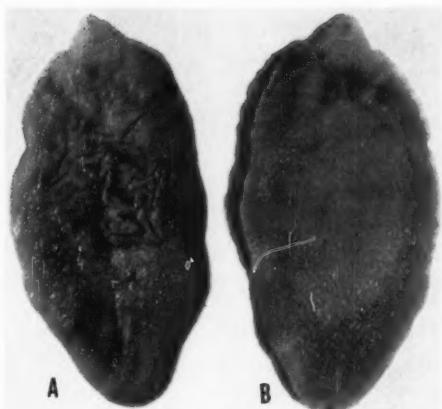


Fig. 1—Dorsal (A) and ventral (B) views of fluke (*Fasciola hepatica*) found in abdominal cavity of Mexican burro. $\times 2.5$.

Necropsy Findings

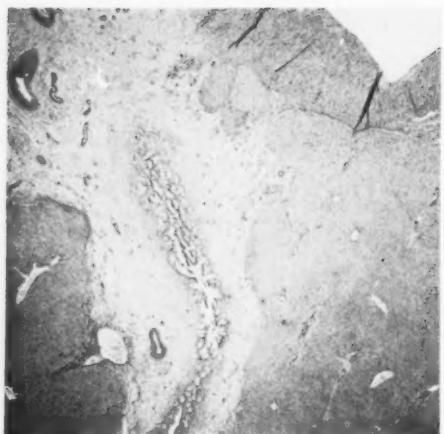
A routine necropsy of this burro was made after euthanasia following experimental infection with the virus of Venezuelan equine encephalomyelitis.

Gross Pathologic Findings.—Scanty subcutaneous fat was present on the abdominal walls; mesenteric fat was virtually absent. Approximately 150 ml. of yellowish fluid was present in the abdominal cavity. A 4-inch specimen of *Setaria* sp. and a small fluke, subsequently identified as *F. hepatica*,¹⁰ were found floating in the fluid (Fig. 1A and 1B).

The parietal pleura appeared normal. The lymphatic tissues were normal in size, color, and consistency. Lungworms were found in bronchi and bronchioles. There was verminous thrombosis of the mesenteric artery. The only finding in the gastrointestinal tract was many red *Gastrophilus* larvae in the cardia of the stomach.

Adhesions were found between the serous capsule of the liver and the diaphragm. The entire surface of the liver was marked with grayish white, threadlike scars extending into the hepatic parenchyma. Fourteen flukes were removed from the bile ducts. The hepatic biliary passages were thickened, but calcification was not observed. Hepatic and extrahepatic biliary passages were not obstructed.

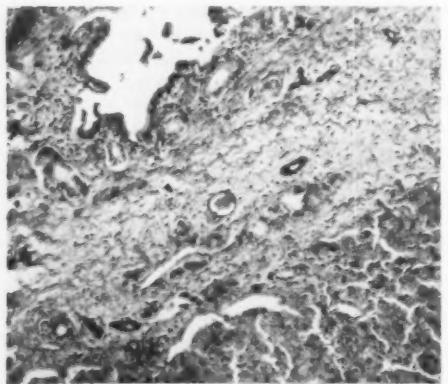
On gross examination of the genitourinary, endocrine, musculoskeletal, and nervous systems, no gross changes were seen.



—U.S. Army Photograph

Fig. 2—Cross section of large bile duct of burro. A large amount of fibrous infiltration surrounds the duct. $\times 11$.

Histopathologic Findings.—The larger interlobular bile ducts of the liver near the hilus, in which the flukes were found, contained a great deal of connective tissue in their walls (Fig. 2). The majority of this tissue was collagenous in nature, with only an occasional area where denser, more mature bundles were present. This fibrous tissue had invaded the parenchyma of the liver, apparently at the expense of the liver cells, for several islands of isolated dying liver cells could be found in the fibrous mass (Fig. 3). Islands of young,



—U.S. Army Photograph

Fig. 3—Photomicrograph of figure 2, showing encroachment on liver cells by infiltrating fibrous connective tissue.

TABLE 1—Parasite Ova Found on Fecal Examination of Burros

Species of parasite ova	No. of animals parasitized*
<i>Strongylus</i> sp.	19
<i>Strongyloides</i> sp.	8
<i>Dictyocaulus</i> sp.	15
<i>Fasciola hepatica</i>	8

*Samples obtained from 19 burros.

newly growing liver cells present in other areas indicated regenerative activity. At the hilus, the large veins intimately associated with interlobular bile ducts were surrounded by a dense, acidophilic, layer of connective tissue. This layer appeared much thickened on the side of the vessel near the duct, less so on the side away from the duct. An excess of fibrous tissue could also be demonstrated around most of the smaller branches of the hepatic artery, vein, and bile ducts. In contrast to the pattern around the larger ducts, no parenchymal invasion could be demonstrated. This appeared to be merely an increase in the normal connective tissue elements about these vessels.

Only isolated foci of inflammatory cells were present, except in areas about the larger interlobular ducts. Here, more diffuse inflammatory cells existed. These consisted primarily of lymphocytes with an occasional plasma cell and polymorphonuclear leukocyte. Eosinophils were not strikingly evident.

Cells of the liver parenchyma as a whole were little damaged and appeared to be functional.

Discussion

Following discovery of the flukes in this burro, fecal samples were taken from the remainder of the band to ascertain the incidence of fluke parasitism in the herd. Flotation and a modified fluke egg demonstration technique¹ were used on each sample. The results of these examinations on the 19 burros remaining in the band are shown (Table 1). Techniques for demonstrating fluke eggs are difficult at best and, at this writing, no chance has arisen for necropsy confirmation of these results. The band, as a whole, however, appears to have significant parasitism with *F. hepatica*. No attempt was made to treat these burros for their parasites.

It is most probable that these burros

acquired the flukes in their native Mexico. The prepatent period for *F. hepatica* is about three months.⁷ The time elapsed from importation to necropsy falls short of the time required for the flukes to have been contracted in this country. Furthermore, much of the state of Tamaulipas is coastal, with many inlet bays and marshes conducive to fluke propagation.

This geographic area of infection does not, however, negate the importance of the parasitism in the individual animal. Since most of the burros in this country are Mexican imports, fascioliasis could pose a problem to the clinician. One cannot exclude the possibility that these burros harbor *F. hepatica* which has successfully adapted itself to life in equine livers as well as those of ruminants.

In those cases where imported burros are found to be unthrifty, appear to be affected by malnutrition and parasitism, yet are unresponsive to routine therapy, parasitism with *F. hepatica* should not be overlooked.

Summary

Fasciola hepatica was recovered from abdominal fluid and bile ducts of a burro of Mexican origin. General unthriftness

observed may have resulted from this parasitism.

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Oral Vaccine for Avian Encephalomyelitis

The safety and efficacy of a live-virus oral vaccine for avian encephalomyelitis (AE) were tested. Results were obtained from 2 laboratory trials and 18 field trials involving vaccination of over 55,000 growing birds and 3,000 breeding birds. Clinical signs of disease did not occur subsequent to vaccination, except for a decrease in production in two of five breeding flocks.

The vaccine, which was chicken embryo-propagated, could immunize via drinking water administration to all birds within a flock or via *per os* dosage of a few (1% or less) birds. In the latter instance, virus dissemination was rapid and thorough. Immune responses were comparable to those observed following natural occurrences of AE. Because of possible interference of parental immunity in birds under 8 weeks old, and egg transmission in breeders, it was recommended that vaccination be done between the 8th and 20th weeks of age.—B. W. Calnek, D.V.M., at the Section on Poultry, 98th Annual Meeting of the AVMA, Aug. 20-24, 1961, Detroit, Mich.

Immunization Against Viral Rhinopneumonitis of Horses with Live Virus Propagated in Hamsters

E. R. Doll, D.V.M.

ABORTION caused by the rhinopneumonitis virus was identified as equine virus abortion but not associated with prior respiratory disease.¹⁻³ A relation between virus abortion and respiratory disease was recognized later, and abortion was regarded as a sequel of equine influenza.^{9,10} Subsequently, a virus was recovered from horses with clinical influenza⁸ and was found to be identical with the abortion virus.⁴ Then another virus was recovered from the undifferentiated equine influenza complex, and specific names were proposed for the two diseases.⁵ "rhinopneumonitis" for that caused by the influenza-abortion virus^{2,8,9} and "arteritis" for that caused by the newly identified virus which produced a disease similar to the influenza-epizootic cellulitis-pinkeye syndrome. Later, a type-A influenza virus was recovered from horses, and it was proposed that the disease be identified as "equine influenza."¹¹

Immunity from Natural Infection.—The immunity resulting from natural infection is of short duration. Virus-neutralizing antibodies persist, but the respiratory mucosa may be reinfected within three to four months. Reinfactions often are afebrile and usually are asymptomatic in farm horses. The effects of reinfections on horses in training and racing are not known. Immunity against abortion is more durable, but it is variable and incomplete. Mares have aborted from natural infection in consecutive pregnancies with intervals of 7 to 11 months between abortions. Mares have been inoculated with native virus early in

gestation and inoculated again with native virus four to six months later, with infection and abortion of the fetus resulting from the second inoculation. Such mares have high levels of virus-neutralizing antibodies but, in a few, virus is transported by an unidentified means from the respiratory mucosa to the fetus and causes abortion.

Concept of Immunization by Planned Infection.—Since the virus causes respiratory disease in young horses and abortion in mares, it is desirable that an immunization procedure establish protection against each. The planned infection program is designed for Standardbreds and Thoroughbreds kept on farms, being trained, and being raced. Inoculations are given at periods when the infection is least likely to interfere with the intended use of the horse. This interference might be abortion by brood mares or interruption of training or racing for other horses.

On farms, the program must be regulated by factors involved in rhinopneumonitis of pregnant mares and by breeding and management practices. An epizootic is observed in young horses each year during the fall and winter. It usually occurs after weaning and the disease is most prevalent during October, November, and December. This epizootic provides a source of virus for infection of pregnant mares which may abort one to four months later. As the disease occurs in Kentucky, abortions have not been observed during July or August, or prior to the fifth month of gestation. The evidence suggests that a set of conditions operates against abortions early in gestation. This evidence is supported by a low incidence of abortion among mares inoculated early in gestation with native virus.⁶ The planned infection program is initiated late in June or early

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in July after foaling is completed, to avoid exposure of mares late in gestation and to take advantage of the factors that apparently operate against abortion early in gestation. The inoculations are repeated again in October to obtain additional immunogenic stimulation. This is necessary because of the short duration of immunity. All horses on a farm are inoculated at each period regardless of age, sex, pregnancy, or barrenness. Inoculation of all horses is an integral part of protecting pregnant mares. Resistance is established in all horses with reduced opportunity for introduction and spread of native virus which might cause abortion.

Young horses are inoculated in July when sucklings, in October when weanlings, and again in the following July when yearlings. This practice is followed to reduce the possibility of epizootics in young horses on farms and to establish resistance before the young horses enter training and racing.

Since immunity, even that from natural disease, is of short duration, it is desirable to maintain pathogenicity and antigenicity at as high a level as is safe for practical use. Interference with intended use of young horses can be avoided by planned infection before beginning training and racing. Actually, it would be preferable to use unmodified virus in young horses, if it could be done without exposing pregnant mares. The problem in safety, therefore, is finding a degree of modification that allows the virus to be used among pregnant mares.

Virus for Immunizing Inoculations.—Two strains of rhinopneumonitis virus were employed, Ky-B and Army 183. Immunizing inoculums were a 2% extract of infected hamster livers in 5% trypticase or casitone broth. The inoculums contained $10^{6.5}$ to $10^{7.5}$ hamster LD₅₀ per milliliter.

Administration of Virus.—The virus is administered only by intranasal instillation using a special tube.* It is inserted in one nostril to the nasopharynx, and inoculum is expelled forcibly as the tube is withdrawn. The dose is 3 ml. Reasons for employing intranasal inoculation are (1) antibody response and duration of immunity are equal to those obtained from parenteral inoculation; (2) immediate postvaccination reactions are less severe; (3) there is no danger of introducing pyogenic organisms

with subsequent development of abscesses; and (4) there is no danger of anaphylactic reactions that attend parenteral injection of foreign protein.

Administration is facilitated by use of a semiautomatic syringe assembly consisting of a 5 or 10 ml. record-type syringe, a vented filling tube for 250 or 500 ml. bottles, 5 ft. of rubber tubing, and a bivalve assembly.**

Experimental Studies

Development of Antibody.—Development of virus neutralizing antibody was determined after inoculation with native Ky-B strain for 9 young horses, after 49th, 60th, and 70th hamster passage virus for 12 young horses were free of antibodies, indicating for 6 mares. Serum samples of the young horses were free of antibodies, indicating that they had had no prior infection by the virus. Serum of each mare contained antibodies, indicating previous infection. Antibodies were detectable in serum of the young horses at eight to ten days and maximal titers were attained in 14 to 21 days. In the mares, the response was detectable in six or seven days and maximal titers had developed by 12 to 14 days.

Immunization of Weanlings and Yearlings.—Seven horses were inoculated intramuscularly and 55 were inoculated intranasally with virus propagated in hamsters. The antibody response from each route was comparable. Virus-neutralizing titers ranged from $10^{3.2}$ to $10^{6.5}$ at three weeks. Immunity was challenged by intranasal inoculation with parent virus propagated in horses. Horses were immune at three or four weeks. Immunity was challenged in 9 horses at 14 weeks, 8 horses at 12 weeks, and 4 horses at ten weeks. Virus-neutralizing titers of their serums ranged from $10^{0.5}$ to $10^{5.2}$ when challenged. Reinfection of some horses was evidenced by a mild fleeting febrile reaction of 1 to 2 degrees F., a mild serous rhinitis evident one to three days, and a mild leukopenia. Each horse had an increase in virus-neutralizing titer. The findings demonstrated that either intranasal or intramuscular inoculation establishes a protective, but not a durable, immunity.

Contact Transmission of Virus Propagated in Hamsters.—Contact transmission

*Doll Nasal Catheter, Goshen Laboratories, Inc., Goshen, N.J.

**B-D No. 470, Becton Dickinson Co., Rutherford, N.J.

was tested by pairing weanling horses in box stalls. Each pair obtained water from one pail, grain from one feed box, and hay from one rack. One of each pair was inoculated, and contact was maintained four weeks. Infection of the uninoculated horses was verified by development of antibodies against the rhinopneumonitis virus. Four of the 5 uninoculated horses developed titers equal to or exceeding those of the principals. Contact transmission obviously may occur.

Safety Tests in Pregnant Mares.—Experimental tests for determining safety of virus propagated in hamsters for pregnant mares employed 35 subjects inoculated at 7 to 11 months in gestation. Normal foals were produced by 34 mares. Each of these mares had a significant antibody titer when inoculated, with titers ranging from $10^{2.5}$ to $10^{4.2}$. Each mare responded with an increase of titer, which ranged from $10^{4.5}$ to $10^{8.7}$, and a few developed a mild fleeting fever. One mare, without a significant serum titer, delivered a live foal 62 days after inoculation. It died at 30 hours after birth and had typical lesions of fetal rhinopneumonitis.

The serum titers of the mares that produced normal foals were comparable to titers found in mares on farms in Kentucky, Pennsylvania, Ohio, and Virginia. The test indicated reasonable safety for representative farm mares and, in combination with known safety of inoculation early in gestation,⁶ encouraged field trials.

Febrile Reactions.—Of 53 susceptible young horses inoculated intranasally with virus propagated in hamsters, 22 had fleeting, mild febrile reactions, 10 had fever for one day, 8 had fever two days, 3 for four days, 1 for five days, 3 for six days, and 1 for seven days. One had erratic fever over a seven-day period. Four had biphasic fever which occurred on postinoculation days 1 and 2 and again at seven to ten days. The highest body temperatures were between 102.0 and 102.9 F. for 16 horses, 103.0 and 103.9 F. for 9 horses, 104.0 to 104.9 F. for 4 horses, and over 105.0 F. for 2 horses. The temperatures of 22 horses remained below 102.0 F. Fever appeared between postinoculation days 1 and 4.

Febrile reactions of pregnant mares were different from those observed in susceptible young horses. One mare without a significant virus-neutralizing titer had a febrile reaction like that of young suscep-

tible horses. Eight of 34 mares that had had previous infection developed fever. Febrile reactions occurred at seven to ten days and persisted one to two days. Highest temperatures varied from 102.0 to 104.4 F. Similar reactions were observed in young horses at seven to ten days after intranasal inoculations with horse-passaged virus for challenging immunity resulting from immunizing inoculations given three to four months previously. Comparable febrile reactions occurred in some yearlings at six to ten days after their third or fourth immunizing inoculation.

Field Trials

A practical testing program on farms was initiated in July, 1958, and was expanded in 1959 and 1960. Practical testing at training areas was initiated in December, 1959, and expanded in 1960.

Serologic Responses.—The antibody response was determined by virus-neutralization tests⁷ on serum samples obtained at the time of inoculation and 28 days later. A summarization of the responses is given (Table 1). Of the vaccinated mares, 53% did not respond to the initial inoculation in July, and 72% did not respond to the second inoculation in October; 30% of the yearlings did not respond to their first inoculation. A response was not obtained in 49% of the suckling foals and in 22% of the same foals after their second inoculation.

All of the mares and yearlings had significant titers when inoculated, indicating prior natural infection. Failure of response occurred principally in horses having titers above $10^{4.5}$. Inoculation of 43 mares twice annually over a two-year period maintained titers above 10^4 in 128 of 129 collections and above 10^5 in 100 of the 129 samples. The findings demonstrated that nearly all mares on Kentucky farms have had immunologic stimulation from prior natural infector that 30 to 50% respond at each inoculation period, and that titers are maintained at high levels by inoculating twice annually.

The response of suckling foals was influenced by the colostral antibodies in their serum. In general, those with titers above 10^4 did not respond or responded poorly. Foals over 80 days old usually responded, developing titers of 10^4 to $10^{4.5}$. Nearly all

TABLE 1—The Virus-Neutralizing Antibody Response of Mares, Yearlings, and Foals at 28 Days After Immunizing Inoculation with Live Virus Propagated in Hamsters

Effect on titer \log_{10}^4	Horses with specified change of titer (%)				
	Mares' 1st inoculation*	Mares' 2nd inoculation*	Yearlings' 1st inoculation*	Foals' 1st inoculation**	Foals' 2nd inoculation**
Reduced	31.56	38.71	10.41	19.23	0.0
No change	1.05	6.67	0.0	7.69	5.70
+0.1-0.5	21.04	26.70	20.83	23.07	17.10
+0.6-1.0	23.14	18.69	10.41	15.38	17.10
+1.1-1.5	8.41	8.41	12.49	1.92	13.30
+1.6-2.0	5.26	2.66	2.08	3.84	7.6
+2.1-2.5	4.20	0.0	4.16	1.92	7.6
+2.6-3.0	3.15	0.0	12.49	3.84	3.8
+3.1-3.5	1.05	0.0	4.16	1.92	7.6
+3.6-4.0	0.0	0.0	14.58	5.77	5.7
+4.1-4.5	0.0	0.0	6.24	7.69	9.5
+4.6-5.0	1.05	0.0	0.0	3.84	3.8
* ^a , 1-6.0	0.0	0.0	0.0	3.84	1.9
Total No. horses	95	76	48	52	52

*First experience with vaccine virus; inoculations made in July, 1959. **Second experience with vaccine virus; inoculation made in October, 1959. ^aHamster LD₅₀ of virus neutralized by 1 ml. of serum.

foals responded to the second inoculation in October. The titers receded and nearly all responded again the following July when yearlings. Titers obtained in yearlings after the third dose were comparable to those of adult horses.

Immunization of Pregnant Mares on Farms.—Combined data for three years of field testing included immunizing inoculations for 4,298 mares with confirmed pregnancies during the fall on 60 participating farms. The abortion of 3 fetuses, 0.07%, was due to a virus not obtainable for classification; the abortion of 14 fetuses, 0.32%, was due to the vaccine virus; and the abortion of 24 fetuses, 0.56%, was due to native virus. The total was 41 abortions for an incidence of 0.95% among mares having a total of 4,298 pregnancies. These data may be compared with 75 abortions resulting from native virus for an incidence of 16.8% among 477 pregnant mares on 35 nonparticipating farms which had epizootics during the three-year period. On all central Kentucky farms, the total number of abortions by unvaccinated mares, including those introduced to participating farms several weeks or months after the fall inoculations, exceeded the number on participating farms by a ratio of 2 to 1.

Some interesting facts may be derived by comparing the time between immunizing inoculation and abortion for mares aborting from the vaccine virus and those aborting from native virus. Of 14 abortions resulting from vaccine virus, 4 occurred between 48 and 60 days after inoculation, 4 between 60 and 90 days, and 6 between 90 and 115 days. Of 24 abortions due to native virus, 1 occurred at 85 days after the immunizing inoculation, 13 between 108 and 116 days, 9 between 121 and 143

days, and 1 at 166 days. Ability to identify the vaccine virus provides conclusive information on the period elapsing between infection of the mare and abortion. This period, which varied from 48 to 115 days, is considerably longer than observed in mares inoculated intravenously with native virus. In these, nearly all abortions occurred between 15 and 40 days but a few occurred 80 to 90 days after inoculation. After nasal or oral inoculation with native virus, incubation periods for abortion ranged from 44 to 90 days. The longer periods are in agreement with studies on the epizootiology of clinical rhinopneumonitis in young horses with simultaneous exposure of pregnant mares which abort one to four months later.

The time between immunizing inoculation and abortion indicates that the infections by native virus occurred some 30 to 90 days after the immunizing inoculations. Such infection with subsequent abortion by some mares is quite possible. Short duration of immunity creates a situation favoring a low incidence of abortion by mares in a planned infection program. Immunity of horses that are completely refractory at four weeks after an immunizing inoculation may wane sufficiently in another six to eight weeks for reinfection of the respiratory tract. Therefore, it should be expected that, in some mares that do not respond to the immunizing inoculation in the fall, immunity will have waned sufficiently in another one to three months for reinfection of the respiratory tract by native virus. The same situation applies to the vaccine virus. Mares that lose refractivity between the summer and fall vaccinations acquire vaccine-virus infection with the attending possibility of abortion.

It is evident that a low incidence of abortion must be expected in mares in a planned infection program. Abortion may result from either native virus or the vaccine virus. The planned infection program, however, does appear to maintain a resistant population of mares, to prevent explosive epizootics of abortion, and to hold the incidence of abortion at a low level.

Immunization of Other Horses on Farms.—During the three-year period, the doses of vaccine virus administered to horses on farms was 14,045 for brood mares, 3,877 for sucklings, 3,164 for weanlings, 3,886 for yearlings, and 1,560 for other horses.

Brood mares and barren mares have no observable reaction to the vaccine virus. A few may have low and erratic thermal responses at two to ten days after inoculation.

Suckling foals usually have no visible reaction except a slight serous nasal discharge, usually between postinoculation days 2 to 5. The reaction in sucklings is modified by passive protection derived from colostral antibody. Some suckling foals have no thermal reaction, many have a mild, transient thermal reaction, and some react as fully susceptible subjects. No foal has had a reaction of serious nature. The desirability of inoculating young foals has been questioned because of the erratic response. The practice is recommended for several reasons. Since the vaccine virus may be transmitted between horses, it is desirable that the foals receive uniform exposure to the modified virus rather than be exposed to a series of passages of the virus through horses. Simultaneous inoculation of all horses allows the vaccination infection to proceed and to dissipate uniformly. This is important, considering that it may be necessary to move horses to or away from the premises. Establishing serviceable resistance in young horse appears to require both repeated infection and aging. Inoculation of sucklings provides opportunity for one additional experience with the virus before the horses reach the critical period of training and racing. A severe reaction in a young suckling is extremely unlikely, except that it may be possible in the newborn foal of a fully susceptible mare. This could happen only from the initial inoculation on a premise. It seems a remote possibility among Thoroughbreds and Standardbreds, since no fully susceptible mare

has been encountered among approximately 400 given serum-neutralization tests prior to immunizing inoculation.

The postvaccinal reactions of weanlings were variable, as a result of modified susceptibility resulting from prior inoculation as sucklings. Most weanlings had no visible reaction except a slight serous nasal discharge from postinoculation days 2 to 4. Some febrile reactions, varying from a slight increase to temperatures of 104 F., and persisting for one to four days, occurred between postinoculation days 2 and 10. Feed and water consumption were not affected. Some developed a mucopurulent nasal exudate 7 to 14 days after inoculation. No treatment is needed unless a protracted febrile reaction develops. The secondary bacterial infection probably is beneficial in the total infection experience which enables the young horse to withstand exposure when entering training or racing.

Reactions in yearlings without previous infection were similar to those observed in susceptible weanlings. Yearlings having had previous natural infection and those inoculated previously when sucklings and weanlings often had no detectable reaction. Some had a slight serous nasal discharge and some had fever of 1 to 2 degrees F. lasting one to three days.

Immunization of Horses in Training.—A total of 2,214 inoculations were given in the winters of 1959 and 1960. Inoculations in 1959 were initiated in December and January. The horses were in various stages of training. Some were being worked hard and others very lightly. The horses were from 2 to 10 years old; most were between 2 and 4 years old. Many of the 2-year-old horses had received inoculations previously in July and October. The horses were continued on their regular training schedules, and most had no visible reaction. Some, particularly 2-year-olds, developed fever (1 to 3 degrees F.) which persisted one to four days. Horses with fever were rested until it subsided and then returned to training gradually. No complications developed, and there were no serious interruptions of training.

In one training area, there was an epizootic of respiratory disease typical of race track cough approximately 12 weeks after inoculation. Affected horses had fever with temperatures ranging from 102 to 105 F. Coughing was the principal clinical

sign. Some had mucopurulent nasal discharges. Etiology of the epizootic was not determined. Nasal swabs taken from 26 horses during the early acute stages did not yield a virus in cultures of horse kidney or in embryonating eggs, suckling hamsters, or horses. These horses received a second immunizing inoculation in March, 1960, at which time they were in full training. They were worked through the racing circuit in 1960 without further trouble from respiratory disease. The circumstances under which the epizootic of coughs occurred and the failure to recover virus indicated that the epizootic was due to an infectious agent other than the rhinopneumonitis virus. The freedom from respiratory disease during the racing period is believed to have resulted from the total infection experience, including the inoculations with vaccine virus and the epizootic of coughs of unidentified etiology.

Horses at five training areas received immunizing inoculations in the winter of 1960-1961. At one area, inoculations were made early in December and again in March. At the other four areas, a single inoculation was made in January. Postvaccinal reactions in some 2- and 3-year-old horses were similar to those observed previously. Those which had fever were rested until the fever subsided and then continued in training. There was no serious interruption of training for any horse. Horses from each training area have gone to the racing circuit and have been free of respiratory disease to midsummer.

Summary and Conclusions

A procedure for immunizing horses against viral rhinopneumonitis, by planned infection with live virus slightly modified by passage in hamsters, is described.

The immunizing inoculations are made early in July and again in October. All horses on a farm are inoculated, regardless of age, sex, pregnancy, or barrenness. The program is initiated only in July. This period is selected because it avoids exposure of mares late in gestation and takes advantage of natural conditions that apparently operate against abortion early in gestation. Inoculations are repeated in October because of the short duration of immunity. October is selected for the

second inoculation in order to establish a high resistance before occurrence of the epizootic of rhinopneumonitis in young horses that is common in the late fall and winter.

Inoculation of all horses is an integral part of protecting the pregnant mare. It maintains a relatively uniform resistance of all brood mares. It establishes resistance in young stock and other horses, which suppresses the possibility of introduction and spread of native viruses which cause abortion. The immunization program maintains the virus-neutralizing antibodies in the serum of mares at high levels. The series of three inoculations that young horses are given as sucklings, weanlings, and yearlings result in an accumulative antibody response. After the third inoculation, antibody levels of yearlings are comparable to those of adult horses and subsequent reinfections are of subclinical, asymptomatic nature.

Immunity against reinfection of the respiratory tract persists for three to four months. Immunity against infection which results in abortion is more durable, but it is extremely variable. Immunologic protection against abortion is complicated by the short duration of immunity against respiratory infection and by an unidentified mechanism which enables transport of virus from the respiratory mucosa to the fetus in a few mares with high levels of circulating antibodies. These conditions preclude practical possibility of solid protection against abortion by immunologic procedures. The objectives of the immunization program, therefore, are establishing resistance to respiratory infection in young horses, reducing the over-all incidence of abortion, and preventing abortion storms on individual farms.

Because of the short duration of immunity and loss of antigenicity as the virus is attenuated, it is necessary to maintain pathogenicity of the virus at as high a level as is safe for practical use in enzootic areas. A degree of attenuation has been selected at which the virus remains infective by intranasal inoculation and stimulates an antibody response that is approximately $1 \log_{10}$ dilution lower than that obtained from the parent strain. The vaccine virus retains the capacity of causing mild febrile reactions, slight leukopenia, and mild serous rhinitis in fully susceptible horses. Fevers usually range

from 1 to 3 degrees F. and persist one to three days. The leukopenia is mild, erratic, and fleeting. The rhinitis is evident only as slight increase of serous fluid, and usually is not observed on casual examination. A mucopurulent rhinitis resulting from secondary bacterial infection may occur in some young horses following their first experience with the vaccine virus. The vaccine virus is transmissible between horses in close contact.

During the three years of practical field testing on 60 farms, immunizing inoculations were given to mares having a total of 4,298 pregnancies that were confirmed by rectal examination near the time of the second inoculation in October. Of the 4,298 pregnancies, 3 fetuses (0.07%) were aborted as a result of infection by an unclassified virus; 14 (0.32%) were aborted as a result of the vaccine virus; and 24 (0.56%) were aborted as a result of native virus, for a total of 41 abortions (0.95%). During the same period, 35 non-participating farms had abortions involving 477 pregnant mares, of which 75 (16.8%) aborted. Horses at training areas were given 2,114 inoculations during the midwinter of 1959 and 1960. Horses in one group had an undiagnosed respiratory infection approximately 12 weeks after inoculation. Except for this incident, the horses have worked through subsequent racing periods without disabling respiratory disease.

Findings in experimental and field trials indicate that:

1) The infection-immunization procedure suppresses the over-all incidence of abortion by mares in an enzootic area.

2) It is effective for preventing explosive occurrences of abortions on individual premises.

3) A series of three inoculations of young horses on farms at the suckling, weanling, and yearling periods, followed by a subsequent inoculation when they enter training, enables them to go through training and subsequent racing without disabling by rhinopneumonitis infection.

4) The abortion incidence of 0.3% from the vaccine virus indicates that the immunization procedure is relatively safe for use on mares in an enzootic area.

5) It is not possible to obtain solid or permanent immunity against either respiratory infection or abortion caused by the rhinopneumonitis virus.

6) Abortion caused by the rhinopneumonitis virus among mares in an immunization program may result from either the vaccine virus or native viruses.

7) The incidence of abortion would be unpredictable if the vaccine virus were administered to fully susceptible mares late in gestation.

8) The variable immunity against reinfection of the respiratory tract with transport of virus to the fetus in some mares with high levels of virus-neutralizing antibody indicates that any modified live virus capable of propagating in horses may have a potential for causing abortion.

9) The vaccine virus is transmissible between horses in close contact, making it desirable not to move horses from or introduce them to the premises for three weeks after the virus is administered.

10) An infection-immunization program should be initiated with caution on isolated farms with no history of rhinopneumonitis.

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Editorial

A Bargain in Knowledge

A most convenient time for AVMA members to subscribe to one of the "best buys" in veterinary literature occurs in December. An appropriate mark on the annual dues notice and an additional \$5.00 starts a one-year subscription to the *American Journal of Veterinary Research*, for which nonmembers must pay \$15.00.

Containing a large measure of the current reports on animal disease research, the *A.J.V.R.* is not *light* reading, but it is *essential* reading for those who would endeavor to keep abreast of advances in veterinary medicine.

This research journal has grown steadily since its inception in 1941 and the position it has attained in world literature justifies our pride in it. About a fifth of the subscriptions go to other countries, and many visitors from abroad have told us that the only previous image they had of veterinary science in North America was based on their reading of the *A.J.V.R.*

Understandably but regrettably, practitioner interest in the *A.J.V.R.* is not very keen in our own country, but we have not yet subscribed to the philosophy that the modern veterinary practitioner is incapable of digesting naught but case reports and cartoons.

To the serious-minded practitioner who realizes that the educational process must not stop with the earning of a diploma, we offer this challenge: for just one year, invest \$5.00 in *your* research journal. Read the summary at the beginning of each article, taking the time to read entirely only those articles that especially interest you. Chances are you'll want to subscribe annually, you'll want to keep the *A.J.V.R.* in your reference library, and you'll like being better informed.

Bind Your Journals?

Many of our readers will not have noticed that beginning with the July 1, 1961, issue the pages of the JOURNAL have been numbered consecutively from cover to cover with no separate or distinctive "advertising page" numbers.

The new pagination has several advantages, among them simplification of indexing and more appropriate identification of feature material. However, those readers who send their JOURNALS to local binderies may wish to provide some special instructions pertaining to material to be retained in the bound volume.

The Publisher's Authorized Bindery Service, Ltd. (see advertisement in this issue) has been instructed to retain the following material in the bound volumes of the JOURNAL: all scientific articles; News from Washington; the News Section; Abstracts from the *A.J.V.R.*; Book Reviews; What Is Your Diagnosis?; the History page; the Public Relations page; and the Clinico-Pathologic Conference.

JOURNALS sent to the Publisher's Authorized Bindery Service will be bound according to the foregoing specifications, but JOURNALS sent elsewhere for binding should be accompanied by specific instructions.

from the Research Journal

Erythrocyte Survival in Experimental Anaplasmosis

The use of Cr⁵¹-labelled red blood cells demonstrated that the survival of erythrocytes during the hemolytic crisis in *Anaplasma marginale*-infected, splenectomized calves is reduced eight- to tenfold. On the basis of the turnover rate of red blood cells, it is hypothesized that a "limiting factor" is operative in the maximal rate at which red

blood cells are removed from the circulation. Experimental data as well as hypothetical calculations are presented which indicate the anemia in this disease is primarily, if not entirely, due to hemolysis.—[N. F. Baker, J. W. Osebold, and J. F. Christensen: *Erythrocyte Survival in Experimental Anaplasmosis*. Am. J. Vet. Res., 22, (May, 1961): 590-596.]

Shipping Fever of Cattle—Prevalence of *Pasteurella spp.* in Nasal Secretions

Nasal swabs from apparently normal calves and from calves with different stages of shipping fever were examined for the presence of *Pasteurella spp.*

Pasteurellas were found in only 3.0% of 200 normal calves but in 59.6% of those with clinical shipping fever.

Of the calves with shipping fever which were given intensive antibiotic therapy, only 13.6% harbored *pasteurellas*; 20.8% of

calves with fever as the only sign of disease had *Pasteurella spp.* Of 109 nasal swabs examined from groups of calves "convalescent" from shipping fever, 43 (39.4%) contained *pasteurellas*.—[A. B. Hoerlein, S. P. Saxena, and M. E. Mansfield: *Studies on Shipping Fever of Cattle. II. Prevalence of Pasteurella Species in Nasal Secretions from Normal Calves and Calves with Shipping Fever*. Am. J. Vet. Res., 22, (May, 1961): 470-472.]

New Books

USDA Radiological Training Manual

This manual was prepared primarily for those who are responsible for conducting radiologic emergency service in the ARS. However, it should prove useful to veterinarians generally who may be expected to advise and contribute their special talents in event of a nuclear disaster.

The first part deals with the theoretical aspects of atomic energy, problems of fallout, and the biological effects of radiation. The

second part describes means of measuring radioactivity and methods of food and water salvage. The third part describes agricultural uses of atomic energy, handling procedures for radioactive materials, and some practical peace-time uses. The fourth part pertains mainly to instruction and teaching as it relates to radiologic science.

Certain sections are particularly worthwhile for veterinarians who may be ex-

pected to explain methods of protecting livestock from fallout or how radioactive-contaminated food products may be salvaged for human consumption.

Much of the material contained has been drawn from lectures prepared and given in

training courses conducted by the ARS staff.—[USDA Radiological Training Manual. Revision. 232 pages; illustrated. U.S. Department of Agriculture, ARS, Washington, D.C. 1961. Price not given.]

Protozoan Parasites of Domestic Animals and of Man

According to the author, when this book was begun it was intended to be a revision of the pioneering *Veterinary Protozoology* by the late Banner Bill Morgan and Philip A. Hawkins, but the result has been an entirely new book. It consists of 14 chapters, an appendix containing scientific and common names of some domestic and wild animals, an index, and host-parasite lists. Not only chapter references but, in most instances, general references appear at the end of each chapter. The references alone make the book invaluable for undergraduate and graduate teaching and for the research worker in protozoology and protozoan diseases. The book is easily read and should be a valuable aid to the practicing veterinarian. Major emphasis is given to the parasites of domestic animals in the temperate zones.

The chapters on the trichomonads and the telosporasida and the coccidia proper are especially recommended to practicing veterinarians.

The factual material is logically presented, and the publishers have reproduced the line drawings with remarkable clarity. There are no pictures, but this does not detract. Neophytes in parasitology may tend to become confused with the nomenclature, but even taxonomists may disagree on taxonomy. This book should be on every veterinarian's desk. Even if used for reference only, it should be well worth the price—[Protozoan Parasites of Domestic Animals and Man. By Norman D. Levine. 412 pages; illustrated. Burgess Publishing Company, 426 South Sixth St., Minneapolis 15, Minn. 1961. Price \$6.50.]—R. D. TURK.

Veterinary Radiology

This book is not only evidence that veterinary radiology has outgrown adolescence, but it is certainly the most complete and scientifically accurate text published on this discipline in any language. It is also the first text in this specialty written by a trained specialist. All phases of the field are covered—from the machine, its accessories, theoretical consideration of radiation, radiography, and both diagnostic and therapeutic use of the x-ray. The style, while somewhat conversational, is lucid and the reader will be led along the paths of diagnosis in sequential steps. The print is large, clearly legible, and easy to read. The book deals with fundamentals, but not in too elementary a fashion.

The author, while primarily a radiologist, takes the clinician's approach—that the case history and physical examination of the patient are important both to the taking and to the evaluation of the radiograph. While this approach may at times entrap the un-

wary by leading him into a preconceived diagnosis, it is certainly better than radiography done just in the blind hope that something will turn up to aid a groping clinician.

Chapter I deals generally with radiographic interpretation, pointing out some of the pitfalls that can snare even the well-trained veterinary radiologist. The second chapter, on the "X-Ray Machine and Accessory Equipment," offers many practical and helpful suggestions and illustrations that will help the veterinarian produce radiographs that are good diagnostic tools. The chapter on positioning and normal anatomy would in itself justify the publication and purchase of this book. Such writing has long been needed and, being well-illustrated, it should set a standard for large and small animal radiography in the field and in the hospital and be immensely helpful, especially to those veterinarians who graduated without adequate instruction in radiology.

Radiation safety is emphasized by color photographs (the only ones in the text) of the hands of two veterinarians that were damaged by x-irradiation. The author shares this reviewer's distaste of veterinary fluoroscopy.

Part II, the "Atlas of Radiographic Pathology," deals with just about all known radiographic diagnoses in veterinary medicine. It is profusely illustrated and may have neglected the cat a bit, but it covers the dog and the horse well. It is only in the section on radiation therapy that the author appears to depart from the clinician's viewpoint and assume that of the radiologist. It is this reviewer's opinion that x-irradiation in veterinary medicine and, while the student and practitioner should be told about it, what therapy is done should be in the colleges and other centers where it can be executed under close control of the specialist. Here, proper protection can be provided and the x-irradiation may be used under the premise of its possible contribution to total knowledge, rather than as therapy for an individual animal. There is sufficient concern at the moment about the radiation that veterinarians are contributing to the atmosphere by their diagnostic work alone. The whole question of x-irradiation of animals for benign and even malignant lesions is certainly debatable.

On "scanning" *Veterinary Radiology*,

thumbing from illustration to illustration, and on studying those radiographs that have to do with subjects of particular interest, we are struck by a feeling of profound dismay by the poor quality of many of the reproductions. The radiographic reproductions are mostly too small, too lacking in contrast, and there are too many poor ones. Fewer, larger, and clearer radiographs would make this a much better book. While the author must share some of the blame for this situation, the publisher who has had wide experience in the medical book field should have made the quality of the paper or its coating better, should have spent more on larger, better quality engravings, and should have known early in the process of putting the book together that the end result would detract from the value of the book—a value which, judging by the price asked, the publisher thinks is considerable.

Despite our criticism as expressed above, we think that *Veterinary Radiology* must and will be used as a teaching text in all veterinary schools and should be in the library of every practicing veterinarian who hasn't forgotten how to read.—[*Veterinary Radiology*. By William D. Carlson. 463 pages; illustrated. Lea and Febiger, 600 S. Washington Square, Philadelphia, Pa. Price \$18.50.]—GERRY B. SCHNELLE.

Veterinary Hematology

The first book on veterinary hematology, "*Grundlagen einer klinischen Hämatologie der Haustiere*" by D. Wirth (Urban and Schwarzenberg, Vienna), was published in 1931. Since it was written in German, its usefulness in this country was limited. We now have a book written in the English language dealing with this subject.

The author has used his extensive experience with the blood of the dog, cat, ox, sheep, goat, horse, and pig in 30,000 blood samples in the Department of Clinical Pathology at the University of California School of Veterinary Medicine, as well as many references, particularly to the literature written in English. Hematopoiesis is dealt with briefly but succinctly. The erythrocytes and anemias are well discussed; leukocytes and their reactions are considered; characteristics of leukemia in cattle, dogs, cats, horses, goats, swine, and sheep are presented. A chapter is given to dis-

cussion of the blood reactions in some common diseases such as nephritis, pyometra, hypothyroidism, panleukopenia, and traumatic gastritis, mastitis, and parturition in cattle. An interesting section is an appendix of 27 cases illustrating characteristic changes of the blood of animals with common diseases.

The book will serve as a guide and practical reference for anyone concerned with this phase of veterinary clinical pathology. The morphologic changes are interpreted to give a modern concept of their significance as an aid in the diagnosis and treatment of disease. It is written for clinicians as well as diagnosticians. It provides an excellent introduction to veterinary hematology.—[*Veterinary Hematology*. By Oscar W. Schalm. 386 pages; well illustrated. Lea & Febiger, Washington Square, Philadelphia 6, Pa. 1961. Price \$9.50.]—CARL OLSON.

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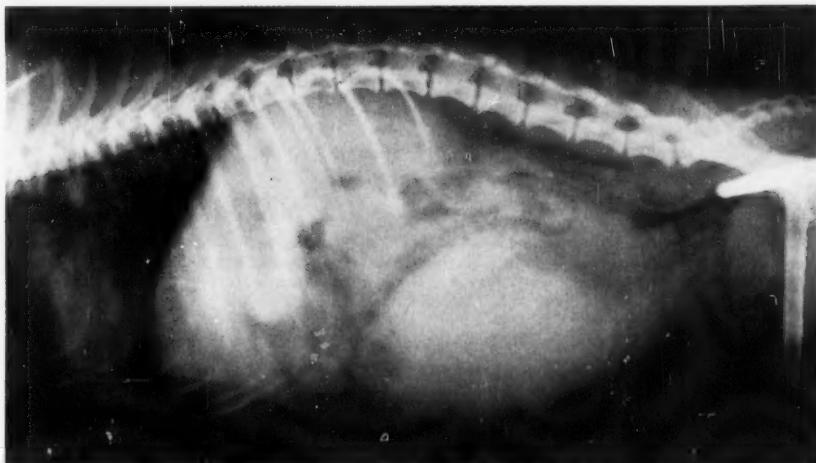


Fig. 1—Radiograph, lateral view, of abdomen of the Pomeranian.

History.—An intact female Pomeranian, 7 years old, developed polydypsia and after two weeks became anorectic. There was no knowledge of a recent heat period and no vaginal discharge. Body temperature was 102.2 F. The abdomen was slightly distended, but abnormal internal masses could not be palpated. A radiograph (Fig. 1), lateral view, was taken.

Here Is the Diagnosis

(Continued from preceding page)

Diagnosis.—A large distended organ in the mid-ventral area of the abdomen was thought to be the uterus distended. Diagnosis of pyometra was verified at surgery (Fig. 2).

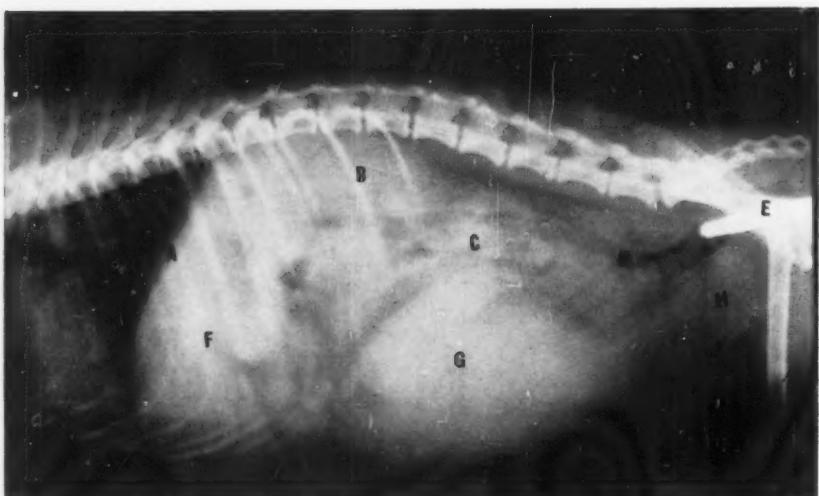


Fig. 2—Radiograph, lateral view, of the Pomeranian: diaphragm (A); kidney (B); small intestine (C); colon (D); opaque catheter (E); liver (F); distended uterus (G); and urinary bladder (H).

Comment.—In about 25% of the dogs with pyometra, there is no vaginal discharge or other signs that would indicate presence of the condition. In some instances, the blood count is within normal range. Such cases offer a real diagnostic challenge, and radiographs are often helpful.

This report was presented by Fred H. Gasow, D.V.M., Richard W. Huff, D.V.M., and L. Maxwell Gasow, D.V.M., Gasow Veterinary Hospital, Birmingham, Mich., and was prepared with the assistance of Wayne H. Riser, D.V.M., M.S., Kensington, Md.

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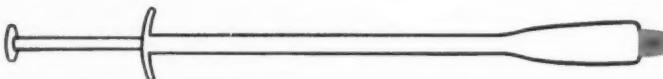
	<i>Services per conception</i>	<i>Days between calvings</i>
Controls	2.85	422
FURACIN-TREATED	1.88	382

"These results confirm the favorable experience reported by other authors using either nitrofurazone [FURACIN] solutions or suppositories to control genital infections in cows with poor breeding efficiency."¹

The FURACIN two-step method for treating impaired fertility:



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Step 2. During the next 3 weeks, insert 1 FURACIN Suppository Veterinary into the anterior portion of the vagina, using a special suppository applicator, 3 times weekly on alternate days. (FURACIN Suppositories Veterinary, box of 12.) The cow may be bred at the next estrus.

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References: 1. Vigue, R. F., et al.: J. Am. Vet. M. Ass. 134:308 (Apr. 1) 1959.

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CLINICO- PATHOLOGIC CONFERENCE

From the School of Veterinary Medicine
University of Pennsylvania

Case Presentation

First Admission



Dr. R. S. Brodey.—An 8-year-old, 22-lb., castrated male dog of mixed breeding was admitted to the clinic on Jan. 19, 1960, with a swollen right hind leg. Previously, in July, 1959, the owner found on returning home that the dog, which had been confined during the day, was unable to bear weight on the right hind leg. A veterinarian diagnosed a fracture of the tibia and advised against treatment. From July, 1959, until January, 1960, there was progressive swelling of the tibial area. The dog refused to bear weight on the limb for the first few months but later it would occasionally use the limb when running.

On examination, there was a firm painless swelling, about 9 inches in circumference, of the entire tibia. The thigh musculature was atrophic.

The serum alkaline phosphatase level was 2.4 Bodansky units (B.U.) and the serum inorganic phosphorus was 4.6 mg./100 cc. The white blood cell (WBC) count was 12,000; segmented neutrophils, 75%; nonsegmented neutrophils, 8%; monocytes, 8%; eosinophils, 6%; lymphocytes, 3%; red blood cell (RBC) count, 5,964,000, with one nucleated RBC/100 WBC.

*Dr. W. H. Rhodes.**—The outstanding radiographic changes were observed in the lower portions of the right tibia (Fig. 1 and 2). The middle third had an irregular, moth-eaten appearance and there was almost complete absence of the distal third, including the epiphysis. Ex-

tensive soft tissue swelling surrounded the distal two-thirds of the tibia. Fractures were present in the proximal third of the tibia and fibula and in the proximal third of the fibula. A malignant bone tumor was diagnosed. A radiograph of the thorax was negative.

Prepared by:

R. S. Brodey, D.V.M., M.Sc. (V.S.)

Assistant Professor of Veterinary Surgery

J. E. Prier, D.V.M., Ph.D.

Associate Professor of Virology



Dr. Brodey.—On January 20, a mid-femoral amputation was performed. Before surgery, a tight tourniquet was placed proximal to the tumor for the purpose of preventing systemic emboli.

Most of the distal third of the tibia and tibial articular cartilage was destroyed. The remainder of the tibia was diffusely infiltrated by a tumor mass which measured 12 by 6 by 5 cm. On cut surface the soft, grayish tumor tissue contained scattered foci of bone formation, hemorrhage, and necrosis. The postoperative course was uncomplicated, and the dog was discharged from the hospital on January 24.



*Dr. J. T. McGrath.**—Histologically, most of the tibia was replaced by a very cellular tumor in which there was much osteoid formation. The histopathologic diagnosis was osteosarcoma.

*Assistant professor of veterinary radiology.

*Professor of veterinary pathology.

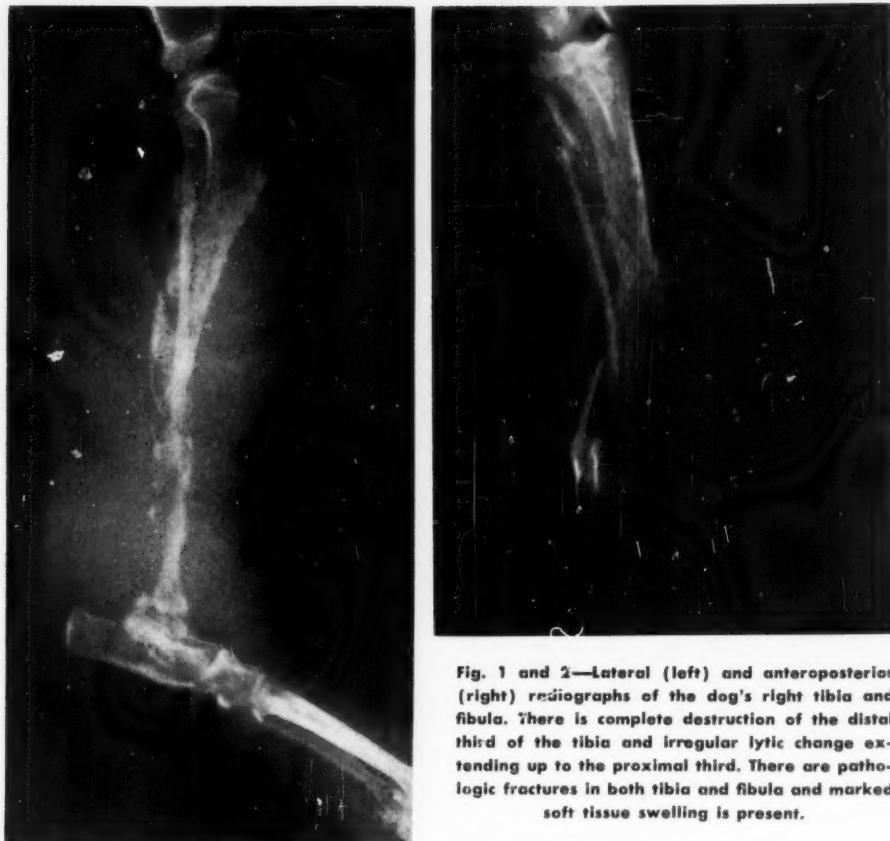


Fig. 1 and 2—Lateral (left) and anteroposterior (right) radiographs of the dog's right tibia and fibula. There is complete destruction of the distal third of the tibia and irregular lytic change extending up to the proximal third. There are pathologic fractures in both tibia and fibula and marked soft tissue swelling is present.

Second Admission

Dr. Brodey.—The animal did well at home until February 14 when it suddenly became anorectic and lethargic and lost the ability to urinate, defecate, or to use its left hind leg. When examined, it was depressed and its bladder and rectum were full. The left hind limb was flaccid, but normal pad pinch and patellar reflexes were present.

The dog was hospitalized on Feb. 17, 1960, and treated with prednisolone. An enema was given and 250 cc. of urine removed by catheterization. On February 20, it was able to urinate and defecate and had regained some use of its left hind leg. During the next two days, there was improved function of the hind limb. The dog was discharged on February 22 and the owner

was given a prescription for prednisolone tablets (1 mg.) to be given twice daily.

Third Admission

Dr. Brodey.—The improvement in hind limb function was transient. The dog soon began to knuckle on the leg, and it was unable to bear weight. Urination and defecation were normal and the appetite was fair. The pupillary, palpebral, placing, and hopping reflexes, and the flexor reflexes in the forelegs and hind leg were all normal. However, the extensor postural thrust reflex was absent in the hind leg.

The dog was hospitalized for the third time on March 1, 1960. The serum alkaline phosphatase level was 3.4 B.U., and the serum inorganic phosphorus level was 5.9

mg./100 cc. Except for some apparent pain in its hindquarters on March 5, its condition remained essentially unchanged until March 18, at which time the dog was unable to urinate. During the following seven days, the bladder had to be manually expressed. Hematuria and pain developed in the region of the urinary bladder. The left hind limb was now completely paralyzed. Euthanasia was performed on March 25.

Dr. Rhodes.—I was unable to detect any evidence of metastatic lung disease on lateral radiographs of the thorax taken on February 18 and March 23. Lateral radiographs of the lumbar and caudal half of the thoracic spine taken February 18 and March 23 suggested an intervertebral disk protrusion.



*Dr. S. A. Steinberg.**—I would like to comment on the second admission of February 17. The dog was admitted in a debilitated condition and was anorectic and lethargic. It is possible that the inability to walk and to eliminate urine and feces were manifestations of his poor general condition rather than signs of true paralysis. This is supported in part by the statement that a flaccid paralysis existed at this time. The term "flaccid paralysis" is generally reserved for those conditions in which there is complete loss of tone to the muscles involved. It implies that the muscles are denervated (either sensory or motor). This denervation can have a number of causes and may be reversible. But no matter what the cause, the flaccidity is due to the loss of the myotactic reflex.

Very briefly, this reflex mechanism is as follows: Afferent impulses arise from proprioceptive receptors in the muscle, which are stimulated when the muscles are stretched. Since these receptors in the normal animal are constantly being stimulated to some degree, there is constant afferent stimulation which acts through a short reflex arc and motor nerves. This results in postural tonus. The mechanism of the patellar reflex, which is really the response to stretch of the quadriceps muscle due to the tendon tap, is identical with the mechanism which results in normal pos-

tural tone. A positive patellar reflex was present when the dog was admitted on February 17. Since the nerve pathways for postural tone and patellar reflex are the same at the segmental level, I think it is unlikely that the animal had a true flaccid paralysis.

Prior to the third admission, there had been a gradual onset of hind limb paralysis. This was followed in a couple of weeks by urinary retention and pain in the bladder area. At this time, the forelimb reflexes and the segmental reflexes of the hind leg were normal, but the extensor postural thrust was negative. This latter response differs from the segmental reflex responses in that the spinal cord must be intact through its entire length for the response to be normal. Purely segmental reflexes might be present even if the cord segments are isolated from the rest of the spinal cord. These two findings indicate that the spinal cord pathways were interfered with, but the level of the lesion must be cranial to the area of the cord that contributes to the lumbosacral plexus.

The urinary retention which the dog had may have a similar origin since a spinal cord lesions at any segmental level or even higher in the brain stem may cause urinary dysfunction. Both of these abnormal findings could, therefore, have a common cause with a cord lesion cranial to L₂ or L₃. The normal responses of the forelimbs, both segmental and postural reflexes, indicate that the lesion is probably below the cervical or perhaps first thoracic cord segments. The hematuria and pain can be explained on the basis of a cystitis secondary to urine retention.

In this particular case, it is difficult to lateralize the lesion, since one leg has been amputated. Ordinarily, since the decussations of the motor pathways are in the brain stem, the more severely affected limb would indicate the side on which the lesion is present. If we knew something about cutaneous sensation over the paralyzed limb, we might be able to tell which side of the cord was involved. Myelography would be necessary to pinpoint the lesion.

Having a general idea, then, of where the lesion is, the next question to be answered is "what is the lesion?" A differential diagnosis should include the following: (1) a prolapsed intervertebral disk; (2) vertebral fracture; (3) cord tumor; (4)

*Assistant instructor in veterinary medicine.

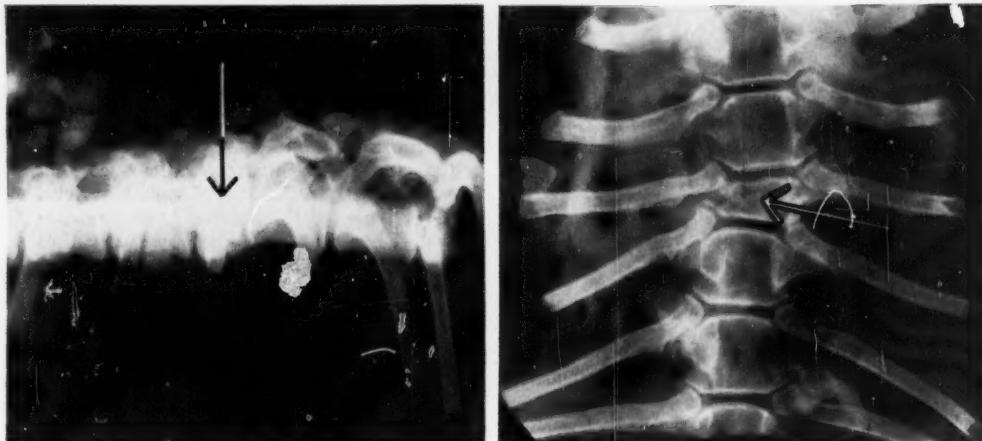


Fig. 3 and 4—Lateral (left) and anteroposterior (right) postmortem radiographs of the cranial thoracic vertebrae; there is a pathologic fracture of vertebra T4 (arrows) secondary to metastatic osteosarcoma.

vertebral tumor. I will dismiss a traumatic spinal fracture immediately in this case, since it is not supported at all by the history or the clinical course of this paralysis.

Prolapsed intervertebral disk is the most common cause of this clinical syndrome. In this case, it would certainly be valuable to know exactly where the lesion was, since the occurrence of prolapsed disks in the thoracic area cranial to T_{10} is practically unknown. Even though this particular dog is not of the breed or type in which disk protrusion is common, this diagnosis must be considered. One could theorize that many stresses would be applied to the vertebral column in a dog with an amputated limb, and that these might be related to disk prolapse. If there is good radiographic evidence for a disk protrusion between T_{10} and L_1 , it would certainly be significant in the final diagnosis.

The third situation worth considering is cord compression resulting from a tumor of the vertebral column. Since this dog has a history of previous osteosarcoma, this would seem to be a good possibility even though the serum alkaline phosphatase level was normal. Visualization of the contour of the vertebral canal by myelography might have aided in the final diagnosis.

The final possibility is a tumor within the spinal canal, either (a) intramedullary, involving the substance of the cord, or (b) extramedullary, arising from tissue within the spinal canal other than the cord. Lymphosarcoma is probably the most common extramedullary tumor. Lipomas and meningiomas also have been reported. Be-

cause there is no evidence for a diagnosis of lymphosarcoma, and because of the relatively low incidence of other extramedullary or intramedullary cord tumors, less weight will be given to these in the differential diagnosis.

For the final diagnosis, it seems that the two most likely causes for this posterior paralysis would be (1) prolapsed intervertebral disk or (2) a metastatic lesion related to the tibial osteosarcoma. It would seem that radiopaque myelography would have been the most useful single technique for making the final diagnosis. In any event, the history of previous sarcoma and the lack of good evidence for a prolapsed disk suggest the latter.

Clinical Diagnosis

Metastatic vertebral tumor or intervertebral disk protrusion.

Pathologic Findings

Dr. McGrath.—On March 26 a necropsy was performed. The wall of the urinary bladder was thickened and its lumen was filled with a viscous green exudate. The fundic mucosa was diffusely reddened. Histologically, there was a hemorrhagic purulent cystitis. Multiple gritty nodules, 1 mm. in diameter, were scattered throughout all lobes of the lungs. Histologically, these lesions were typical osteosarcomas. Longitudinal section of the spinal column re-

vealed a prominent irregularity at the level of T₄, which was brittle on cut section. The spinal cord at T₄ was markedly compressed and there was considerable hemorrhagic discoloration which extended cranial to T₃ and caudal to T₅. There was no delineation between gray and white matter on cross section of the cord.

Histologically, the marrow spaces of vertebra T₄ were extensively infiltrated with osteosarcomatous tissue. There was a marked compression myelitis extending from T₃ to T₅. In this area of the cord, there was complete destruction of the gray and white matter which would also destroy the vestibulospinal tracts, implying loss of postural authority in the hind limb. There was also complete destruction of the dorsal white columns which would relate to kinesthetic sensation with subsequent knuckling of the hind paw. Urine retention and secondary cystitis occur regardless of the location of the cord lesion.

Dr. Rhodes.—The compression fracture of the fourth thoracic vertebra was clearly outlined on radiographs of the thoracic spine taken postmortem (Fig. 3 and 4). This can be seen to best advantage in the ventrodorsal radiograph but is also visible on the lateral radiograph. Retrospective examination of the lateral thoracic radiograph taken on March 23 also reveals this fracture but the military metastatic lung nodules are still not detectable.

Dr. McGrath.—The neurologic evaluation of posterior paresis in this dog is rather difficult, since one limb was amputated. With the usual tumor involving the cord itself, there frequently an insidious unilateral onset which couldn't be evaluated in this particular dog.

Dr. Brodley.—I'd like to make several comments concerning this case. Osteosarcoma is an unusual lesion in small dogs; in a survey of 77 osteosarcomas which I made several years ago, only three occurred in small breeds. The radiographic appearance of this tumor was not typical of osteosarcoma. Usually such lesions have varying degrees of osteoblastic activity. The extreme lytic nature of this tumor reminded me of a hemangiosarcoma of the tibia in a Boxer which we observed several years ago.¹ The relatively long history of six

months between the time of the initial pathologic fracture and the amputation is also unusual for osteosarcoma.

This case also illustrates the fact that a normal serum alkaline phosphatase level does not rule out the possibility of osteosarcoma. It has been shown in one study² that the mean alkaline phosphatase value in 65 dogs was 1.5 B.U. with a range of 0.20 to 3.28 B.U., and that the results varied considerably with feeding and at certain times of the day.

Of approximately 120 malignant bone neoplasms of skeletal origin observed here from 1951 to 1960, this is the only one I can remember in which skeletal metastasis was found. The incidence of secondary bone involvement would be higher if every dog with an osteosarcoma were subjected to complete radiographic study of its skeleton. Most dogs with bone tumors are euthanatized early in the course of the disease and thus do not have time to develop metastatic bone disease. On the other hand, we have observed metastases to bone in over 20 dogs with soft tissue malignancies, particularly hemangiosarcomas. That tumor cell emboli might reach the spinal column via the vertebral vein system has been demonstrated.³

This case illustrates the difficult problem of radiographic detection of small metastatic lung lesions. In many cases it is not possible, particularly in large dogs. Thus in many instances lung metastases remain undetected preoperatively.

Pathologic Diagnosis

Osteosarcoma of the right distal tibia, with metastasis to the lungs and the body of the fourth thoracic vertebra.

Compression myelitis between T₃ and T₅.

Secondary hemorrhagic purulent cystitis.

References

¹Brodley, R. S., McGrath, J. T., and Reynolds, H.: A Clinical and Radiological Study of Canine Bone Neoplasms. Part 1. J.A.V.M.A., 134, (Jan. 15, 1959): 53-71.

²Shields, R. P.: A Comparison of Serum and Bone Alkaline Phosphatase Activity of Normal Dogs to that of Dogs with Hypertrophic Pulmonary Osteoarthropathy. Thesis, Alabama Polytechnic Institute, in partial fulfillment of requirement for degree of M.Sc. in veterinary medicine, Aug. 22, 1959.

³Batson, O. V.: The Function of the Vertebral Veins and Their Role in the Spread of Metastases, Ann. Surg., 112, (1940): 138-149.

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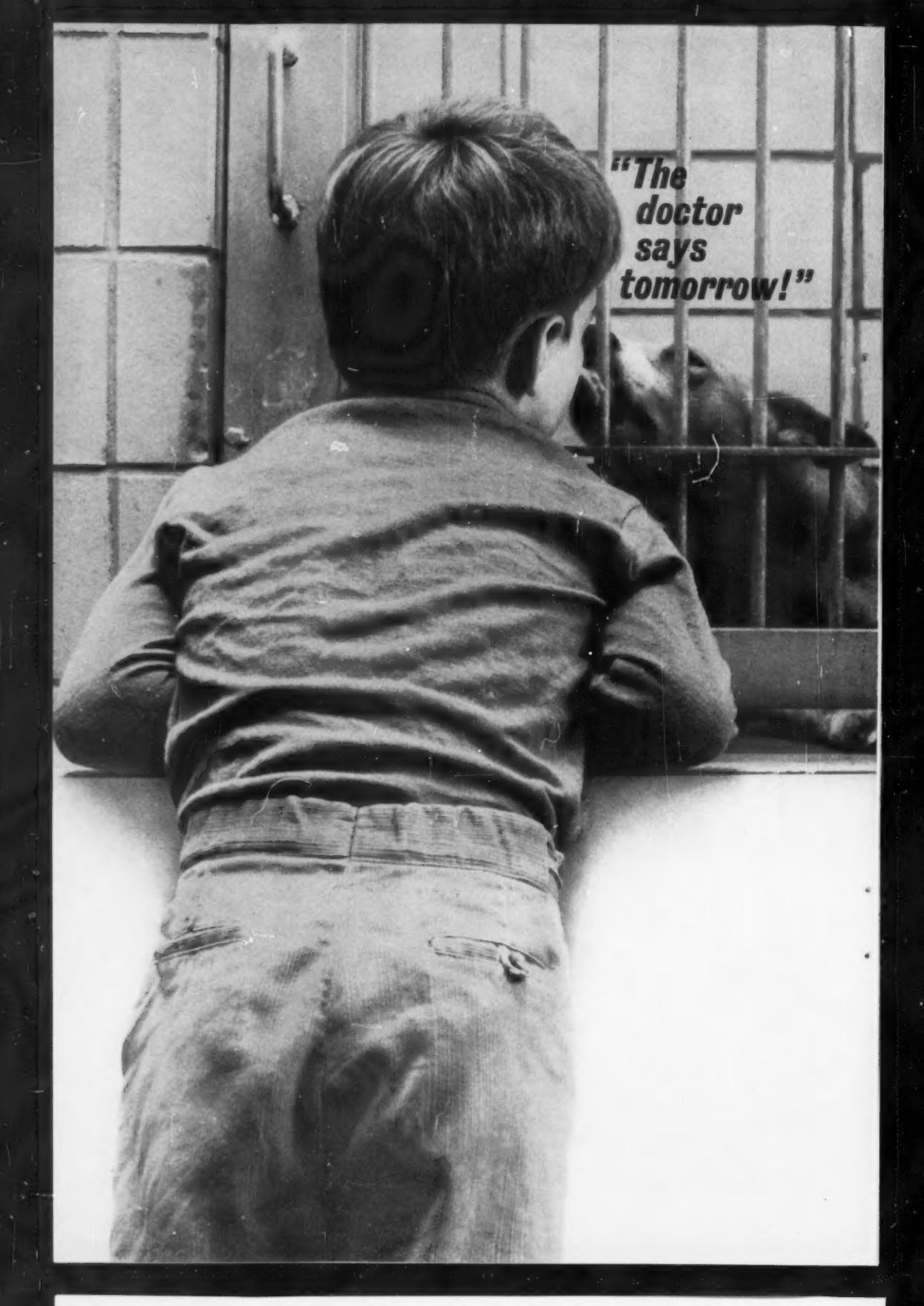
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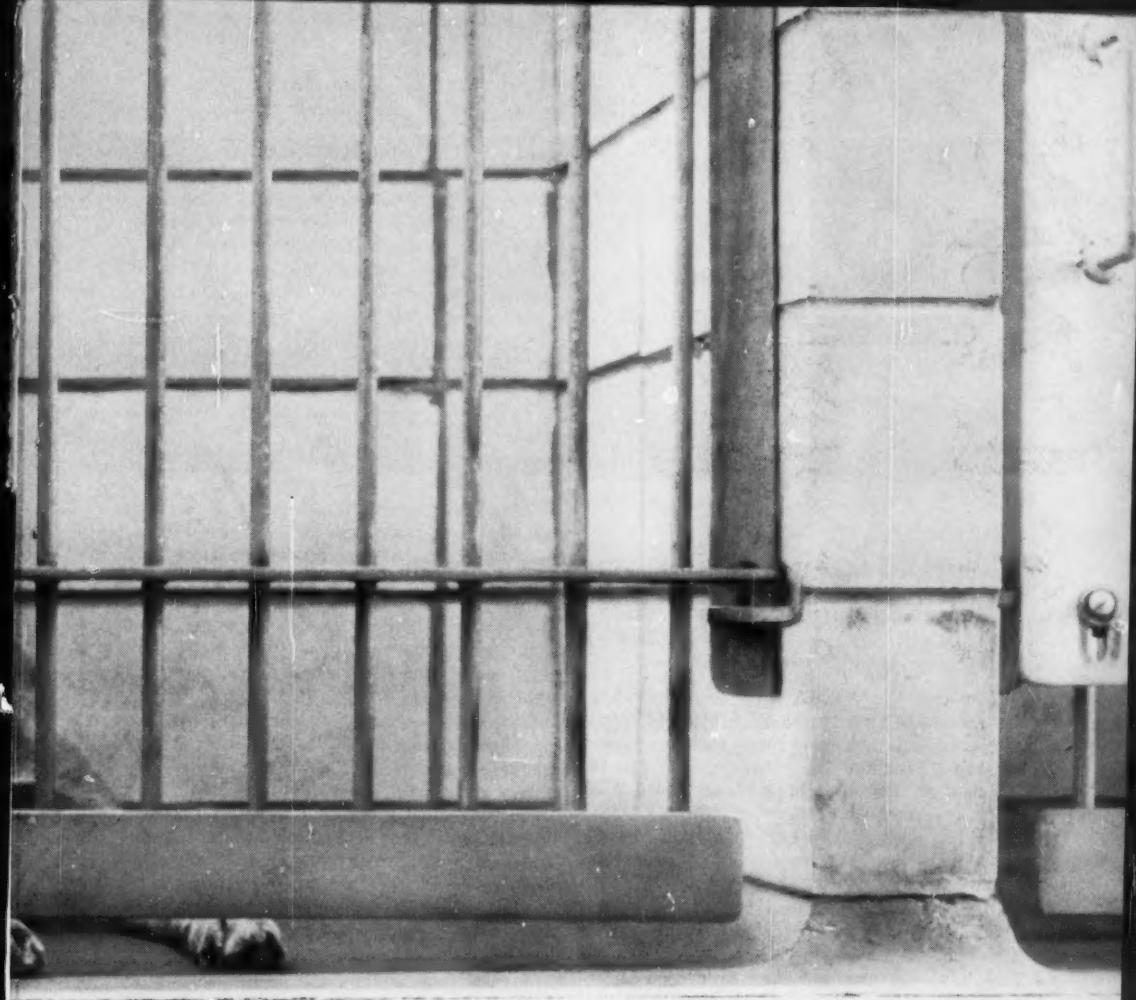
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Public Relations

"Third Man" Theme of Panel at Secretary's Conference

How can the AVMA help to strengthen the membership picture of state and provincial associations and build its own membership to include the "third man" who is not now a member? This topic occupied a half-day panel discussion at the AVMA's Third Annual Conference of Constituent Association Secretaries in Chicago on November 4.

Panel members were Mr. Paul Cain, Dr. Fred Wertman, and Dr. Fred Hall, secretaries of the Texas, Iowa, and Indiana V.M.A.'s respectively. They described their activities in membership promotion and retention and suggested ways in which the AVMA could help them.

Strong liaison between the AVMA, the constituent secretary, and the constituent membership committee was described as the keynote to successful membership promotion by Dr. Hall. As soon as a new veterinarian is reported in Indiana, a member of the membership committee residing in the same congressional district is assigned to invite him to participate in the Indiana V.M.A. The membership committee coordinates its efforts with the AVMA's Department of Membership Services so that the AVMA can communicate with the veterinarian as well. In this way, the benefits of membership in organized veterinary medicine at all levels can be demonstrated to the veterinarian.

Speaking of the Texas program, Mr. Paul Cain also emphasized the importance

of face-to-face contact in membership promotion and retention. Since Texas is nearly the largest state in the union, the association employs field men to carry the association's story to its members and prospective members. To illustrate the advantages of membership, the Texas V.M.A. uses a slide-tape presentation narrated by the president of the state association. Mr. Cain showed the presentation to the secretaries and urged them to prepare similar audiovisual materials. He emphasized that the tape was inexpensive to prepare and could be easily transported to be shown before local groups or individuals.

Dr. Wertman of the Iowa V.M.A. discussed the advantages of increased communications between state associations and their memberships. "Communication is a two-way street," Dr. Wertman pointed out. The leader of the state association must know what the members wishes are and must have facilities for telling members what the state V.M.A. is doing to implement these wishes. In Iowa, members are informed through a newsletter and the magazine the *Iowa Veterinarian*. Association staff and officers are kept intimately informed of the membership's opinions through recently instituted "fireside chats" in which ideas are informally exchanged at local meetings throughout the state.

Surveying the plans announced by the AVMA for coordinating state programs of membership promotion and retention, Dr. Hideya Kumata cautioned the secretaries against relying too heavily upon the printed word as a means of motivation. Dr. Kumata is professor of communications research at Michigan State University and is frequently engaged as a consultant in communications by professional associations.

The panel's work was summarized in a quotation from AVMA President Morris' Detroit address: "The AVMA needs the 'third man's' membership and, even more important, he needs the AVMA services and benefits. We can improve our profession, create a better public image, and increase our stature only if we all work together to attain our goals on a broad professional basis—both as individuals and as a team. I urge each AVMA member to make an effort to bring that 'third man' into the AVMA fold."

S/R. D. MORRISON
Director of Membership Services



What's new at the Purina Dog Care Center

by Dr. J. E. Corbin
Manager,
Dog Research

(Report No. 2)

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%P.....	.58	%P..... 1.18

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POINTER A DEVELOPS RACHITIC CONDITION

At termination of the project, Pointer A was almost unable to stand... her bones were soft and fragile. Note where left femur had broken and healed crooked.



POINTER B GREW STRONG AND HEALTHY

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Coming Meetings

Notices of coming meetings must be received 30 days before date of publication.

American Animal Hospital Association. Regional Meetings. Dr. Frank R. Booth, 3920 E. Jackson Blvd., Elkhart, Ind., executive secretary.

Region 2. Hotel Patten, Chattanooga, Tenn., Feb. 11-12, 1962.

Region 3. Secor Hotel, Toledo, Ohio, March 26-27, 1962.

Region 4. Mayo Hotel, Tulsa, Okla., Jan. 20, 1962. Texas Hotel, Fort Worth, Texas, Feb. 4, 1962. Colorado State University, Fort Collins, Colo., Feb. 18, 1962.

Region 5. Sheraton Meeting House, Honolulu, Hawaii, May 16-17, 1962.

December, 1961

Oklahoma State University. Refresher Course in Small Animal Anesthesia. Oklahoma State University, College of Veterinary Medicine, Stillwater, Okla., Dec. 22-23, 1961. Tuition \$30. Dr. P. B. Barto, College of Veterinary Medicine, Oklahoma State University, Stillwater, Okla.

January, 1962

Cornell University. Conference for Veterinarians. Cornell University, New York State Veterinary College, Ithaca, N.Y., Jan. 10-12, 1962. Dr. Peter Olafson, Department of Pathology, Cornell University, Ithaca, N.Y., program chairman.

New York State Veterinary College, Cornell University. 54th Annual Conference for Veterinarians. New York State Veterinary College, Ithaca, N.Y., Jan. 10-12, 1962. Dr. George C. Poppensiek, dean.

Indiana Veterinary Medical Association. 78th Annual Meeting. Severin Hotel, Indianapolis, Ind., Jan. 14-17, 1962. Dr. Fred A. Hall, Lynn Hall, Purdue University, Lafayette, Ind., secretary.

University of Pennsylvania. Sixty-second annual conference of veterinarians. School of Veterinary Medicine, University of Pennsylvania, Philadelphia, Pa., Jan. 16-17, 1962. Dr. Robert Schwartzman, program chairman.

Michigan State University. Thirty-ninth annual Postgraduate Conference for Veterinarians. College of Veterinary Medicine, Michigan State University, East Lansing, Mich., Jan. 17-19, 1962. Dr. W. W. Armistead, dean.

Tennessee Veterinary Medical Association. Annual meeting. Dinkler-Andrew Jackson Hotel, Nashville, Tenn., Jan. 21-23, 1962. Dr. H. W. Hayes, 5009 Clinton Pike, Knoxville, Tenn., secretary.

Oklahoma Veterinary Medical Association. Annual meeting. Mayo Hotel, Tulsa, Okla., Jan. 21-23, 1962. Dr. W. D. Speer, 538 S. Madison, Tulsa, Okla., secretary.

Minnesota Veterinary Medical Association. Annual meeting. Hotel St. Paul, St. Paul, Minn., Jan. 22-24, 1962. Dr. B. S. Pomeroy, 1443 Raymond Ave., St. Paul 8, Minn., secretary.

Intermountain Veterinary Medical Association. Annual meeting. Newhouse Hotel, Salt Lake City, Utah, Jan. 24-27, 1962. Dr. Bert Reinow, Box 277, Pinedale, Wyo., president.

North Carolina Veterinary Conference. North Carolina State College, Raleigh, N. Car., Jan. 24-25, 1962. Dr. E. G. Batte, Head, Veterinary Section, School of Agriculture, North Carolina State College, Raleigh, N. Car., program chairman.

Mississippi State Veterinary Medical Association, Inc. Hotel Heideberg, Jaxson, Miss., Jan. 27, 1962. Dr. W. H. Lindley, Box 444, Vicksburg, Miss., secretary.

Kansas Veterinary Medical Association. Annual meeting. Broadview Hotel, Wichita, Kan., Jan. 29-31, 1962. Dr. M. W. Osburn, 1525 Humboldt, Manhattan, Kan., executive secretary.

California Veterinary Medical Association. Mid-winter conference. Sacramento Inn, Sacramento, Calif., Jan. 29-31, 1962. Mr. Kenneth Humphreys, 3004 Sixteenth St., San Francisco 3, Calif., executive secretary.

February, 1962

Maryland State Veterinary Medical Association, District of Columbia Veterinary Medical Association, District of Columbia Academy of Veterinary Medicine, American Animal Hospital Association. Joint meeting. Shoreham Hotel, Washington, D.C., Feb. 1-2, 1962. Dr. Harry L. Schultz, Jr., 9011 Hartford Rd., Baltimore 14, Md., secretary.

Connecticut Veterinary Medical Association. Annual convention. Hotel Bond, Hartford, Conn., Feb. 6-7, 1962. Dr. E. H. Patchen, 289 New Haven Ave., Milford, Conn., executive secretary.

Missouri Veterinary Medical Association. 70th annual convention. Hotel Continental, Kansas City, Mo., Feb. 11-13, 1962. Mr. Jack Kroeck, 2207 Oakview Drive, Jefferson City, Mo., executive director.

Nevada State Veterinary Association. Annual winter meeting. Holiday Hotel, Reno, Nev., Feb. 12-13, 1962. Dr. Brian L. Hutcherson, 300 Kietzke Lane, Reno, Nev., secretary.

Society for Study of Breeding Soundness of Bulls. Annual meeting. Colorado State University, Fort Collins, Colo., Feb. 17-18, 1962. Dr. E. J. Carroll, 805 S. Shields, Fort Collins, Colo., secretary-treasurer.

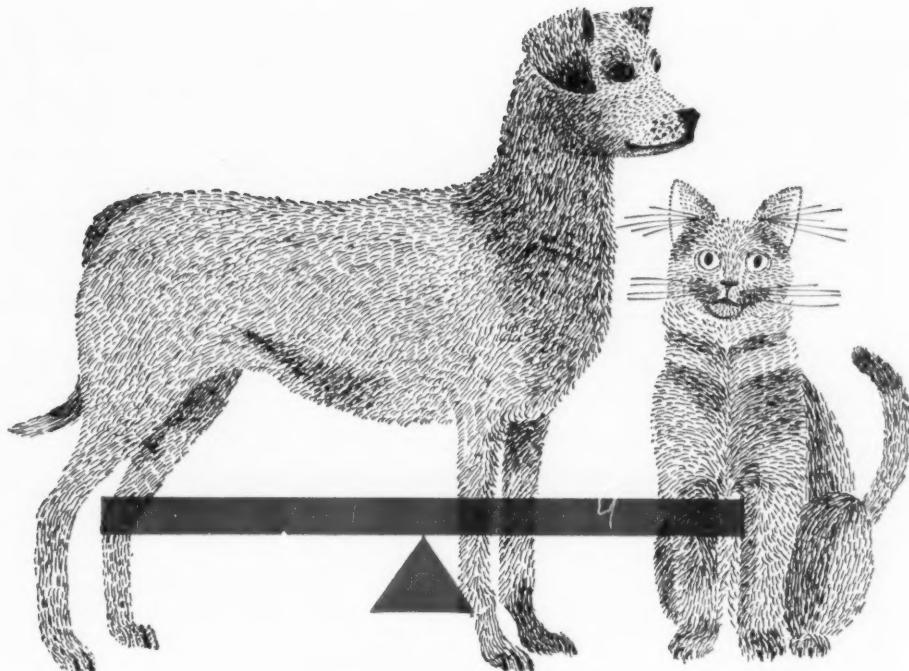
Arkansas Veterinary Medical Association. Forty-fifth annual meeting. Hotel Marion, Little Rock, Ark., Feb. 18-20, 1962. Dr. T. D. Hendrickson, 7824 Cantrell Rd., Little Rock, Ark., secretary.

West Virginia Veterinary Medical Association. Annual meeting. Greenbrier Hotel, White Sulphur Springs, W. Va., Feb. 18-19, 1962. Dr. Harry J. Fallon, 200 Fifth St., W., Huntington, W. Va., secretary.

August, 1962

American Veterinary Medical Association. Ninety-ninth Annual Meeting. Fontainebleau Hotel, Miami Beach, Fla., Aug. 12-16, 1962. Dr. H. E. Kingman, Jr., 600 S. Michigan Ave., Chicago 5, Ill., executive secretary.

Regularly-Scheduled Meetings on page 1352.



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VETERINARY DEPARTMENT **ARMOUR PHARMACEUTICAL COMPANY** KANKAKEE, ILLINOIS



Meetings—continued from page 1350

Regularly Scheduled Meetings

ALABAMA—Jefferson County Veterinary Medical Association, Inc., the second Thursday of each month, Homewood Elks Lodge, Birmingham, Ala. Dr. Monroe J. Bryan, Rt. 3, Box 708, Gardendale, Ala., secretary. Southeast Alabama Veterinary Medical Association, the second Sunday afternoon of January, April, July, and October, Rawls Hotel, Enterprise, Ala. Dr. J. B. Taylor, P.O. Box 96, Elba, Ala., secretary.

CALIFORNIA—Alameda-Contra Costa Veterinary Medical Association, the last Wednesday of each month. Dr. Clyde Brown, Eden Pet Hospital, 1920 Knox St., Hayward, Calif., secretary.

Bay Counties Veterinary Medical Association, the second Tuesday of February, April, July, September, and December. Mr. Herb Warren, 3004 Sixteenth St., San Francisco, Calif., executive secretary.

Central California Veterinary Medical Association, the fourth Tuesday of each month. Dr. A. C. Emminger, Orange and Highway 99, Fresno, Calif., secretary.

Humboldt-Del Norte Counties Veterinary Medical Association, second Tuesday of January, May, September, and November, Eureka, Calif. Dr. M. Lunstra, P.O. Box 734, Eureka, Calif., secretary.

Mid-Coast Veterinary Medical Association, the first Thursday of each month. Dr. William Matulich, P.O. Box 121, San Luis Obispo, Calif., secretary.

Monterey-Bay-Area-Veterinary Medical Association, the third Wednesday of each month. Dr. J. Todorovic, 47 Mann Ave., Watsonville, Calif., secretary.

Northern California Association of Veterinarians, the second Tuesday of each month. Dr. Robert N. Erickson, Rt. 3, Box 22, Chico, Calif., executive secretary.

Northern San Joaquin Veterinary Medical Association, the fourth Wednesday of each month, Hotel Covell, Modesto, Calif. Dr. Wilson Kelly, Rt. 3, Box 234, Lodi, Calif., president.

Peninsula Veterinary Medical Association, the third Tuesday of each month, Villa Chartier, San Mateo, Calif. Dr. J. D. Wood, 2875 El Camino Real, Redwood City, Calif., secretary.

Redwood Empire Veterinary Medical Association, the third Thursday of each month, Green Mill Inn. Dr. Frederick A. Groverman, 8055 Gravenstein Hwy., Cotati, Calif., secretary.

San Diego County Veterinary Medical Association, the fourth Tuesday of each month, 7:30 p.m., Kings Inn, San Diego, Calif. Dr. G. H. Kenaston, 3786 Rosecrans, San Diego, Calif., secretary.

San Francisco County Veterinary Association, the third Thursday of each month, Presidio, San Francisco, Calif. Dr. Norman Green, 2221 Taraval, San Francisco, Calif., secretary.

Tulare County Veterinary Medical Association, the second Thursday of each month. Dr. Robert A. Dove, P.O. Box 881, Porterville, Calif., secretary.

COLORADO—Denver Area Veterinary Medical Society, Inc., the fourth Tuesday of each month, American Legion Post #21, 1370 Broadway, Denver, Colo. Dr. J. G. Harvey, 2110 S. Holly, Denver, Colo., secretary.

Northeastern Colorado Veterinary Medical Association, the first Thursday of each month, Cactus Restaurant, Sterling, Colo. Dr. Don A. Ostwald, 630 Meeker St., Ft. Morgan, Colo., secretary.

Northern Colorado Veterinary Medical Society, the first Wednesday of each month, Hansen's Cafe, Fort Collins, Colo. Dr. Gene Schneider, Veterinary Hospital, Colorado State University, Fort Collins, Colo., secretary.

DELAWARE—Kent-Sussex Veterinary Medical Association, the last Thursday of September, February, May, and July, Alexander's Restaurant. Dr. Ray Sammons, Smyrna RD 1, Delaware, secretary.

FLORIDA—Big Bend Veterinary Medical Association, the second Sunday of each month, Dining Room, Tallahassee, Fla. Dr. R. H. Bennett, P.O. Box 1509, Tallahassee, Fla., secretary.

Hillsborough County Veterinary Medical Association, the first Monday of each month. Dr. R. G. Williams, 4145 N. Armenia Ave., Tampa, Fla., secretary.

Northwest Florida Veterinary Medical Association, the third Wednesday of each month, 7:30 p.m., Chuckwagon, Pensacola, Fla. Dr. R. S. Hardwick, 804 New Warrington Rd., Pensacola, Fla., secretary.

Palm Beach Veterinary Society, the last Thursday of each month, 8 p.m., McArthur Dairy Bldg., 4 Points, W. Palm Beach, Fla. Dr. Jack Liggett, 4501 Broadway, W. Palm Beach, Fla., secretary.

Ridge Veterinary Association, the fourth Thursday of each month, John's Restaurant, Bartow, Fla. Dr. Robert L. Nelson, 3421 Lakeland Hills Blvd., Lakeland, Fla., secretary.

South Florida Veterinary Society, the third Wednesday of each month, Nick & Arthurs Restaurant, 79th St. Causeway, Miami, Fla. Dr. Earl Becker, 7775 Bird Road, Miami, Fla., secretary.

Swannee Valley Veterinary Medical Association, the third Monday of each month, Fanning Springs Restaurant, Fanning Springs, Fla. Dr. C. B. Plummer, Jr., 320 N.W. 30th St., Gainesville, Fla., secretary.

GEORGIA—Georgia-Carolina Veterinary Medical Association, the second Monday of each month, Town Tavern, Augusta, Ga. Dr. Charles R. Wallace, Medical College, University of Georgia, Augusta, Ga., secretary.

Greater Atlanta Veterinary Medical Society, Inc., the third Thursday of each month, Elks Home on Peachtree St., Atlanta, Ga. Dr. Charles A. Greenig, 715 E. College Ave., Decatur, Ga., secretary.

South Georgia Veterinary Medical Association, the first Sunday of January, April, July, and October. Dr. W. F. Schroeder, Animal Disease Department, Tifton, Ga., secretary.

IDAHO—Magic Valley Veterinary Medical Association, the first Friday of each month, Twin Falls, Idaho. Dr. M. W. Thompson, Buhl, Idaho, secretary.

ILLINOIS—Chicago Veterinary Medical Association, the second Tuesday of each month, 9 p.m., LaSalle Hotel, Chicago, Ill. Dr. Jack R. Dinsmore, 2400 Waukegan Rd., Glenview, Ill., secretary.

Eastern Illinois Veterinary Medical Association, the first Thursday of March, June, September, and December. Hotel Tilden Hall, Champaign, Ill. Dr. Russell Beaumont, 1008 N. Cunningham, Urbana, Ill., secretary. Southern Illinois Veterinary Medical Association, the third Thursday of April, and July, and the first Thursday of November. Dr. Leland H. Holt, 2117 Johnson Rd., Granite City, Ill., secretary.

INDIANA—Calumet Area Veterinary Medical Association, the first Thursday of each month except July, August, and January. Wellman's Corral, Valparaiso, Ind. Dr. Bernard Meyerowitz, 1906 Calumet Ave., Valparaiso, Ind., secretary.

Central Indiana Veterinary Medical Association, the second Wednesday of each month, Continental Hotel, Indianapolis, Ind. Dr. R. L. Brutus, 7720 N. Michigan Rd., Indianapolis, Ind.

Michigan Veterinary Medical Association, the second Thursday of each month except July and December. LaSalle Hotel, South Bend, Ind. Dr. R. N. Dale, 330 Pinelake Ave., Laporte, Ind., secretary.

Ninth District Veterinary Medical Association, the third Friday of every other month. Dr. Willis Brown, Seymour Animal Hospital, Seymour, Ind., secretary.

Northeastern Veterinary Medical Association, the second Tuesday of each month, Shrine Temple, Fort Wayne, Ind. Dr. H. M. Bonifield, Warren, Ind., secretary.

Tenth District Veterinary Medical Association, third Thursday of each month. Dr. G. McClarnen, Knightstown, Ind., secretary.

Wabash Valley Veterinary Medical Association, the third Wednesday of each month, Honeywell Memorial Bldg., Wabash, Ind. Dr. Donald J. Meyers, Rt. #5, Wabash, Ind., secretary.

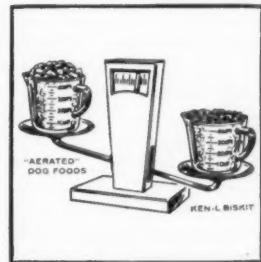
IOWA—Cedar Valley Veterinary Medical Association, the second Monday of each month, except October, January, July, June, and August. Elks Club, Waterloo, Iowa. Dr. H. W. Platte, Waverly, Iowa, secretary.

Central Iowa Veterinary Medical Association, the third Monday of each month, 6:45 p.m., Breeze House, Ankeny, Iowa. Dr. C. D. Lee, 2030 Cessna, Ames, Iowa, secretary.

Continued on page 1356



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History of the AVMA

President C. H. Stange, at the 1924 meeting in Des Moines, pressed for adoption of the statement of policy outlined the year before, and stated, "I cannot too strongly urge this Association . . . to focus its attention on our national problems and be less concerned with the details of our internal organization . . . Our big work, opportunities and problems lie outside . . . of our organization . . . There is a lack of recognition in the profession as well as outside as to the real purpose of the profession. We believe that no country on earth is so safe for animal industry as is this continent, due very largely to the organization and efficiency of the veterinary profession . . . These facts, however, have an economic and sociologic significance not generally understood. We need publicity . . . for these facts to become known."

A. Eichhorn, reporting that 106 persons in 22 states had died of rabies in the past three years, said that the profession should follow a well-defined policy in promoting rabies control "by the prophylactic vaccination," in preference to any other method. "Opposition . . . can be readily met by education and sound arguments and therefore . . . the veterinarian should employ such means to popularize the vaccination of dogs . . . [and] to point out the erroneous stand which the anti-vivisectionists are taking in this matter."

Speaking on the financing and promotion of veterinary education, W. Giltner observed, "Veterinary education must come to stand before the public as education at its best and truest sense, and veterinary practice as a noble and indispensable art firmly grounded in science . . . Financing a project of advertising veterinary education might be undertaken jointly by the veterinary colleges, the AVMA, and . . . state associations . . . The federal government should also . . . [financially assist] veterinary education." Dr. Giltner suggested a grant of \$1,000 to each student from a state without a veterinary college, to be paid by the government or the state involved.

Other papers presented were on uterine pathology by E. T. Hallman; estrus in domestic animals by H. S. Murphey, G. W. McNutt, B. A. Zupp, and W. A. Aitken; the army veterinary school by R. A. Kelser; goose septicemia by F. R. Beaudette; sheep problems by I. E. Newsom and F. Cross, and E. T. Baker; agricultural extension by T. E. Munce; foot sur-

gery by T. H. Ferguson; and bovine abortion by E. C. Schroeder and W. E. Cotton.



CHARLES HENRY STANGE, born in Cedar County, Iowa, May 21, 1880, did farm work for several years before choosing a career in veterinary medicine. He graduated from Iowa State in 1907 with the highest honors in the entire university, and became Assistant Professor of Veterinary Medicine that fall. His administrative abilities prompted his appointment to the deanship in 1909; he held this post until his death, when he was the country's ranking veterinary dean. Iowa State was first with a four-year veterinary course, and under Dr. Stange, was first to require high school graduation for matriculation (1911), and a year of pre-veterinary college work (1931).



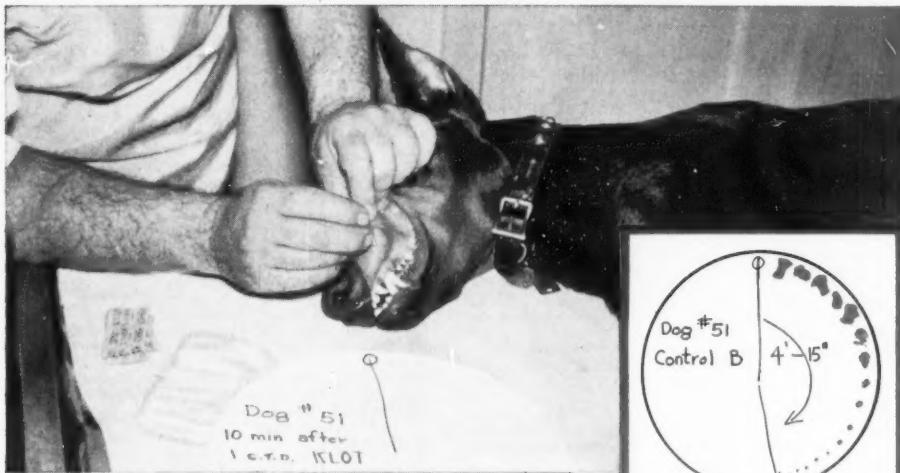
Dr. C. H. Stange

Dr. Stange originated the idea of AVMA student chapters and lived to see them in all of the schools in the United States and one in Canada. He joined the AVMA in 1907, was chairman for three of the nine years he was a member of the Executive Board, and was elected AVMA president in 1923.

At the time of his death on April 26, 1936, it was said, "Perhaps it would be no exaggeration to say that Dean Stange had a greater influence on veterinary education in this country during the past two decades than did any other member of the veterinary profession."

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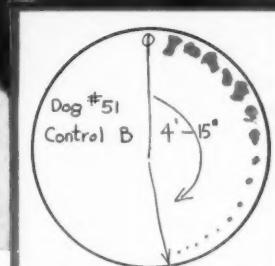
CONTROL HEMORRHAGE!



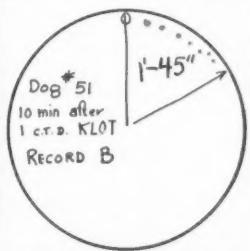
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DALLAS

CHATTANOOGA

LOS ANGELES

PORTLAND

Continued from page 1352.

Fayette County Veterinary Association, the third Tuesday of each month, Lotus Restaurant or Boot Hill Supper Club, 6:30 p.m. Dr. Brandt, Garnavillo, Iowa, secretary.

North Central Iowa Veterinary Medical Association, the third Thursday in April, Warden Hotel, Fort Dodge, Iowa. Dr. John Eppley, P.O. Box 797, Fort Dodge, Iowa, secretary.

Southeast Iowa Veterinarians, the first Tuesday of each month, Iris Court, Mt. Pleasant, Iowa. Dr. J. R. Cowles, Burlington, Iowa, secretary.

Southwestern Iowa Veterinary Medical Association, the first Tuesday in April and October, Hotel Chiefton, Council Bluffs, Iowa. Dr. Alex Hogg, Coin, Iowa, secretary.

Upper Iowa Veterinary Association, the third Tuesday of each month, Holiday Lounge, Clear Lake, Iowa. Dr. Charles Strugel, Latimer, Iowa, secretary.

KANSAS—Sedgewick County Veterinary Medical Association, the third Thursday of each month, Stockyards Hotel, Wichita, Kan. Dr. Ernest Boley, P.O. Box 1540, Wichita 1, Kan., secretary.

KENTUCKY—Jefferson County Veterinary Society, the first Wednesday of each month except July. Dr. G. R. Comfort, 2102 Reynolds Lane, Louisville 18, Ky., secretary.

South Central Kentucky Veterinary Medical Association, the last Sunday of February, June, September, and November, Mammoth Cave, Ky. Dr. W. L. Avots, P.O. Box 663, Bowling Green, Ky., secretary.

LOUISIANA—Calcasieu Parish Veterinary Medical Association, the first Tuesday of every second month, 8 p.m., Holiday Inn, Lake Charles, La. Dr. Joseph E. Bruce, P.O. Box 506, Sulphur, La., secretary.

New Orleans Veterinary Medical Association, the fourth Monday of each month, Moutaineone Hotel, New Orleans, La. Dr. Roy Hock, 938 Esplanda Ave., New Orleans, La., secretary.

Northwest Louisiana Veterinary Medical Association, the fourth Wednesday of each month, Brocato's Stopmore Restaurant. Dr. John M. Rust, 9350 Mansfield Rd., Shreveport, La., secretary.

Southwest Louisiana Veterinary Medical Association, the third Sunday in September. Dr. L. H. Pease, 304 Ella St., Lafayette, La., secretary.

MARYLAND—Baltimore City Veterinary Medical Association, the second Thursday of each month except June, July, and August, Park Plaza Hotel, Baltimore, Md. Dr. Dennis G. Foster, 7810 Wise Ave., Baltimore 22, Md., secretary.

MASSACHUSETTS—Boston Veterinary Association, the third Wednesday in February, April, May, October, and December, Angell Memorial Hospital. Dr. Harrison B. Seigle, 290 Bridge St., Dedham, Mass., secretary. Southeastern Massachusetts Veterinary Medical Association, the second Wednesday of each month, Eugene's Route 28, Middleboro, Mass. Dr. William Jones, E. Falmouth, Mass., secretary.

Western Massachusetts Veterinary Medical Association, the first Wednesday of March, June, September, and December. Dr. Douglas N. Stern, Paige Laboratory, University of Massachusetts, Amherst, Mass., secretary.

Central Michigan Veterinary Medical Association, the first Wednesday of each month. Dr. Richard C. Lannen, Elsie, Mich., secretary.

Midstate Veterinary Association, the second Thursday of each month, October through May. Dr. D. B. Coohon, 304 Milford, East Lansing, Mich., secretary. Northern Michigan Veterinary Medical Association, the second Wednesday of February, April, September, and November. Dr. R. W. Waldbey, Rt. #5, Box 236N, Traverse City, Mich., secretary.

Oakland County Veterinary Medical Association, the second Thursday of September, November, January, March, and May. Dr. P. L. De Porre, 4062 W. Maple, Birmingham, Mich., president.

Southeastern Michigan Veterinary Medical Association, the fourth Wednesday of each month September through May, Croation Catholic Center, 201 W. 7 Mile Rd., Detroit, Mich. Dr. S. R. Purvis, 13389 Farmington Rd., Livonia, Mich., secretary.

MINNESOTA—Southeastern Minnesota Veterinary Medical Society, the second Thursday of each month, Kahler Hotel, Rochester, Minn. Dr. Paul E. Zollman, 200 S.W. First St., Rochester, Minn., secretary.

MISSOURI—Greater St. Louis Veterinary Medical Association, the first Friday of each month except July and August, Coronado Hotel, Lindell Blvd. and Spring St., St. Louis, Mo. Dr. H. C. Eschenroeder, 8088 Watson Rd., St. Louis 19, Mo., secretary.

Kansas City Veterinary Medical Association, the third Thursday of each month, Hotel President, Kansas City, Mo. Dr. H. W. Pilcher, 8124 N. Oak St., Kansas City 18, Mo., secretary.

Southeast Missouri Veterinary Medical Association, the third Wednesday of April and September, all day. Dr. John R. Adams, 405 North St., Sikeston, Mo., secretary.

MONTANA—Yellowstone Veterinary Medical Association, the second Thursday of each month, Turf Press Club, Billings, Mont. Dr. B. Hubbell, Jr., 50 Moore Lane, Billings, Mont., secretary.

NEBRASKA—District IV Nebraska Veterinary Medical Association, the third Thursday of each month, 7:00 p.m., Jack's Cafe, Columbus, Neb. Dr. J. L. MacKinnon, Platte Center, Neb., secretary.

NEW JERSEY—Central New Jersey Veterinary Medical Association, the second Thursday of November, January, March, and May, Old Hights Inn, Highstown, N. J. Dr. John W. Flemer, P.O. Box 191, Princeton, N. J., secretary.

Metropolitan New Jersey Veterinary Medical Association, the third Wednesday of each month, October through April, except December, the Coronet, Irvington, N. J. Dr. Henri March, 299 Bloomfield Ave., Verona, N. J., secretary.

North West Jersey Veterinary Society, the third Wednesday of every odd numbered month, 8 p.m., Minton's Restaurant, Stanhope, N. J. Dr Robert A. Moote, RD 1, Box 657, Branchville, N. J., secretary.

Southern New Jersey Veterinary Medical Association, the fourth Tuesday of each month, Collmann Diner, Collingswood, N. J. Dr. Jay Simmons, 247 S.W. H. Pike, Audubon, N. J., secretary.

NEW MEXICO—Bernalillo County Veterinary Practitioners Association, the fourth Tuesday of each month, 12:30 p.m., Fez Club, Albuquerque, N. M. Dr. James Wehrman, 3018 Rio Grande Blvd., N. W., Albuquerque, N. M., secretary.

NEW YORK—Finger Lakes Veterinary Medical Society, the third Wednesday of each month, Colonial Inn, Canandaigua, N. Y. Dr. Joseph Ferris, Holcomb, N. Y., secretary.

Hudson Valley Veterinary Medical Society, the second Wednesday of February, May, August, and November. Dr. T. C. Vaughn, Clarksville, N. Y., secretary.

Long Island Veterinary Medical Association, Inc., the third Thursday of each month, September through May. Dr. J. Asmus Sutorius, 11 Fairway W., Sayville, N. Y., secretary.

Monroe County Veterinary Medical Association, the first Thursday of even numbered months except August, Monroe County Health Department. Dr. Irwin Bircher, 40 Meredith St., Rochester 9, N. Y., secretary.

Southern Tier Veterinary Medical Association, the fourth Thursday of January, April, July, and October. Dr. Donald W. Baker, New York State Veterinary College, Cornell University, Ithaca, N. Y., secretary.

Veterinary Medical Association of New York City, Inc., the first Wednesday of each month, October to June, 8 p.m., New York University Medical Center, 550 First Ave., New York, N. Y. Dr. Irving Zimmerman, 9 West 75th St., New York 23, N. Y., secretary.

NORTH CAROLINA—Eastern North Carolina Veterinary Medical Association, the last Tuesday of each month. Dr. T. B. Ryan, Box 5658, State College Station, Raleigh, N. Car., secretary.

Twin Carolinas Veterinary Medical Association, the third Friday of each month, 7:30 p.m., Orange Bowl Restaurant, Rockingham, N. Car. Dr. J. E. Currie, 690 N. Leak St., Southern Pines, N. Car., secretary.

Western North Carolina Veterinary Medical Association, the third Thursday of each month, The Manor, Asheville,

Continued on page 1358.



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Continued from page 1356.

N. Car., Dr. J. A. Humphrey, 1093 Patton Ave., Asheville, N. Car., secretary.

NORTH DAKOTA—Lake Region Veterinary Association, the second Monday in October, February, and May, Graver Hotel, Fargo, N. Dak. Dr. D. K. Christian, Valley Veterinary Clinic, Fargo, N. Dak., secretary.

OHIO—Cincinnati Veterinary Medical Association, the third Tuesday of each month, Schuler's Wigwam, Hamilton Ave., Cincinnati, Ohio. Dr. Jerry Theobald, 4245 Reading Rd., Cincinnati, Ohio, secretary.

Cuyahoga County Veterinary Medical Association, the first Wednesday of each month, Sheraton Hotel, Cleveland, Ohio. Dr. B. K. Brown, 2573 Wooster Rd., Rocky River 16, Ohio, secretary.

Dayton Veterinary Medical Association, the first Tuesday of each month, 8:00 p.m., Fidelity Pharmacy Bldg., Dayton, Ohio. W. O. Smith, 617 N. Western Ave., Dayton 7, Ohio, secretary.

Killbuck Valley Veterinary Medical Association, the first Wednesday of every other month. Dr. E. M. Finney, Marshallville, Ohio, secretary.

Geauga County Veterinary Society, the second Wednesday of each month, at noon, Manor House, Newbury, Ohio. Dr. Peter Clemens, RFD #2, Chagrin Falls, Ohio, secretary.

Lorain County Veterinary Medical Association, the second Wednesday of April, June, August, September, and November. Dr. W. C. Wood, 4205 Oberlin Ave., Lorain, Ohio, secretary.

Madison County Veterinary Association, meetings irregular. Dr. Thomas Wittish, Mt. Sterling, Ohio, secretary.

Mahoning County Veterinary Medical Association, the fourth Tuesday of each month, Chinone's Restaurant, 1108 McGuffey Rd., Youngstown, Ohio. Dr. C. H. Hale, 229 S. Canfield-Niles Rd., Youngstown, Ohio, secretary.

South Central Ohio Veterinary Medical Association, the second Thursday of each month. Dr. J. M. Hagely, 1624 E. Main, Lancaster, Ohio, secretary.

Stark County Veterinary Medical Association, the third Tuesday of each month, Skyway Room, 2720 Fulton Rd., N. W., Canton, Ohio. Dr. Robert J. Kilgore, 5165 Echo Valley St., N. Canton 20, Ohio, secretary.

Toledo Veterinary Medical Association, January, March, July, and October. Dr. Donald R. Knepper, Rt. 1, Maumee, Ohio, secretary.

OKLAHOMA—Tulsa Veterinary Medical Association, the third Thursday of each month, City-County Public Health Bldg., 4616 E. 15th, Tulsa, Okla. Dr. Robert H. Leonard, 410 North 31st St., Muskogee, Okla., secretary.

OREGON—Portland Veterinary Medical Association, the second Tuesday of each month except June, July, and August. Ireland's at Lloyd's Restaurant, 718 N.E. 12th Ave., Portland, Ore. Dr. Forris B. Frick, 8415 S.E. McLoughlin Blvd., Portland 2, Ore., secretary.

Willamette Veterinary Medical Association, the third Tuesday of each month October through June, Salem, Ore. Dr. E. R. Derflinger, 2145 State St., Salem, Ore., secretary.

PENNSYLVANIA—Brandywine Valley Veterinary Association, the third Wednesday of each month, Town Hall, Westchester, Pa. Dr. H. L. Gray, Chadds Ford, Pa., secretary.

Capital City Veterinary Medical Association, the second Thursday of odd numbered months, Colonial Country Club, Dr. Conrad B. Richter, P.O. Box 403, Harrisburg, Pa., secretary.

Conestoga Veterinary Medical Association, the third Friday of each month, September through May, 8:30 p.m., Exchange Room, Union Stock Yards, Lancaster, Pa. Dr. Loy Awkerman, RD 2, Manheim, Pa., secretary.

Keystone Veterinary Medical Association, the fourth Wednesday of each month, October through May, Uni-

versity of Pennsylvania School of Veterinary Medicine. Dr. Jacob L. Kolodner, 7921 Rodgers Rd., Philadelphia, Pa., secretary.

Lehigh Valley Veterinary Medical Association, the first Thursday of each month, 2:00 p.m. Dr. Robert N. Warner, Palm, Pa., secretary.

Northwestern Pennsylvania Veterinary Medical Association, the second Wednesday of January, April, July, and October. Dr. Arthur Richards, Jr., Box 528, Grove City, Pa., secretary.

Penn-Allegheny Veterinary Club, the third Thursday of odd numbered months, Wissinger's Inn, Ebensburg, Pa. Dr. S. B. Guss, Veterinary Science Bldg., University Park, Pa., secretary.

Western Pennsylvania Veterinary Medical Association, the third Wednesday of each month, except June, July, and August, Hotel Roosevelt, Pittsburgh, Pa. Dr. John K. Shrader, 1015 Lincoln Highway, Irwin, Pa., secretary.

SOUTH CAROLINA—Piedmont Veterinary Medical Association, the third Wednesday of each month. Dr. T. F. Fussell, 991 Asheville Hwy., Spartanburg, S. Car., secretary.

TEXAS—Dallas County Veterinary Medical Association, the first Tuesday of each month. Dr. Eldon O'Harrison, 733 Floyd Rd., Richardson, Texas, secretary.

Harris County Veterinary Medical Association, the first Thursday of each month, 8 p.m., Baylor Medical School. Dr. J. P. Rohisheaux, 2919 S. Wayside, Houston 23, Texas, secretary.

Rio Grande Valley Veterinary Association, the second Thursday of each month, 8 p.m. Dr. Jack Gray, Mission, Texas, secretary.

VIRGINIA—Central Virginia Veterinary Association, meetings monthly. Dr. Abraham Linder, 6506 W. Broad, Richmond, Va., secretary.

Northern Virginia Veterinary Conference, the second Wednesday of each month, Lee-Jackson Restaurant, Winchester, Va. Dr. T. P. Koudelka, 116 Reservoir St., Harrisonburg, Va., secretary.

Northern Virginia Veterinary Society, the second Wednesday of January, April, July, and October, 9:00 p.m., Professional Building, Falls Church, Va. Dr. Justin Parvey, 1118 E. Lee Hwy., Fairfax, Va., secretary.

Southwest Virginia Veterinary Medical Association, the first Thursday of each month, Veterinary Science Laboratory, Virginia Polytechnic Institute, Blacksburg, Va. Dr. D. F. Watson, Department of Veterinary Science, Virginia Polytechnic Institute, Blacksburg, Va., secretary.

WASHINGTON—Seattle Veterinary Medical Association, the third Monday of each month. Dr. Frank Lindek, 16408 First Ave., S., Seattle, Wash., secretary.

WISCONSIN—Central Wisconsin Veterinary Medical Association, the second Wednesday of March, June, September, and December. Dr. E. D. Baker, Cameron Wis., secretary.

Coulee Region Veterinary Medical Association, the third Wednesday of odd numbered months, Sparta, Wis. Dr. F. N. Petersen, Box 127, Cashton, Wis., secretary.

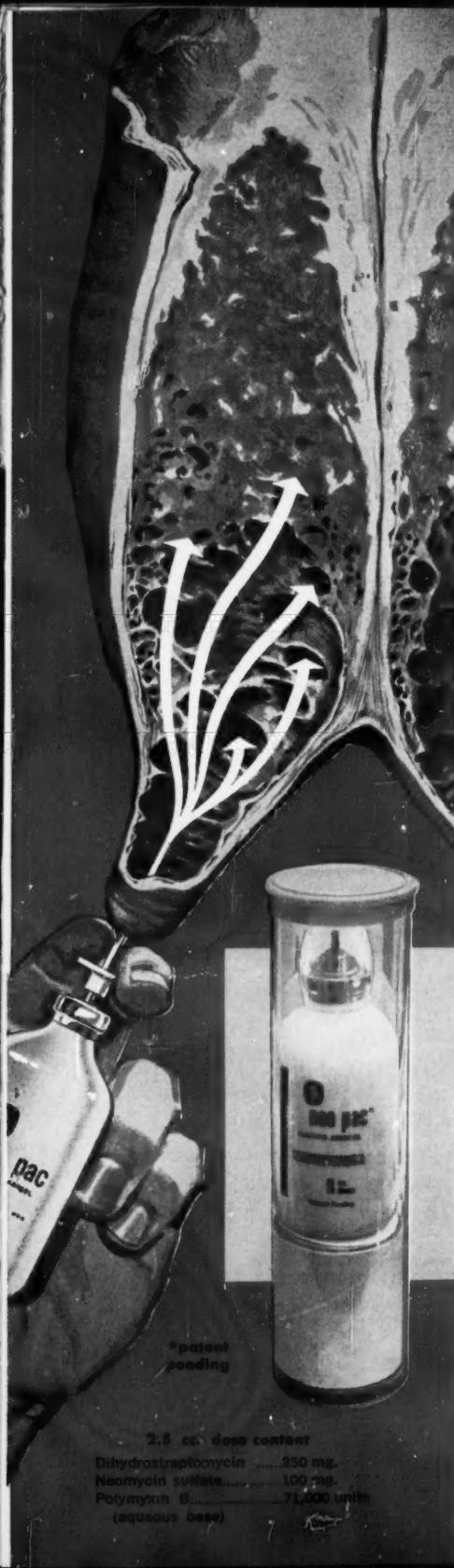
Dane County Veterinary Medical Association, the second Thursday of each month September through May. Dr. James D. Russell, Box 1288, Madison, Wis., secretary.

Milwaukee Veterinary Medical Association, the third Tuesday of each month, Holiday Inn Motel. Dr. Gordon Marold, 4634 W. State St., Milwaukee, Wis., secretary.

Northeastern Wisconsin Veterinary Medical Association, the third Wednesday of April and September. Dr. William Madson, 218 E. Washington St., Appleton, Wis., secretary.

Rock Valley Veterinary Medical Association, the first Wednesday of each month, Janesville V.F.W. Club. Dr. T. A. Rude, Rt. 2, Stoughton, Wis., secretary.

Southeastern Wisconsin Veterinary Association, the third Thursday of each month. Dr. J. Robert Curtis, 419 W. Cook St., Portage, Wis., secretary.

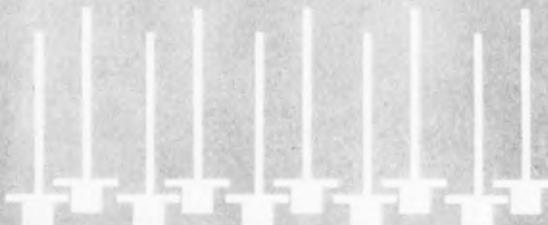


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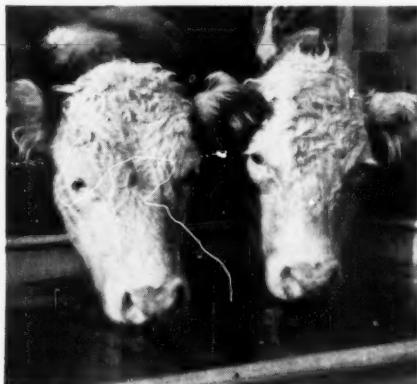
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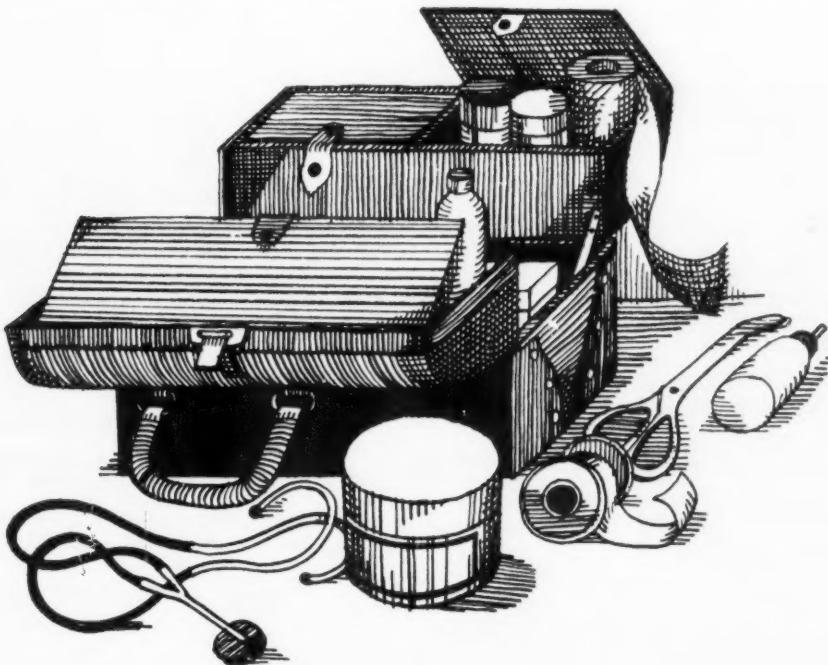
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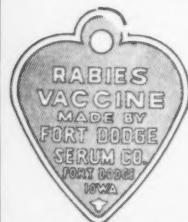
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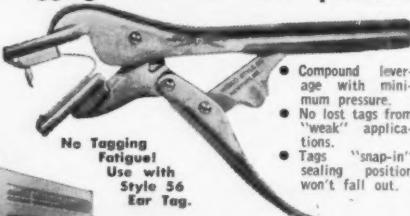


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